

Flight, November 12, 1910.



FLIGHT



First Aero Weekly in the World.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

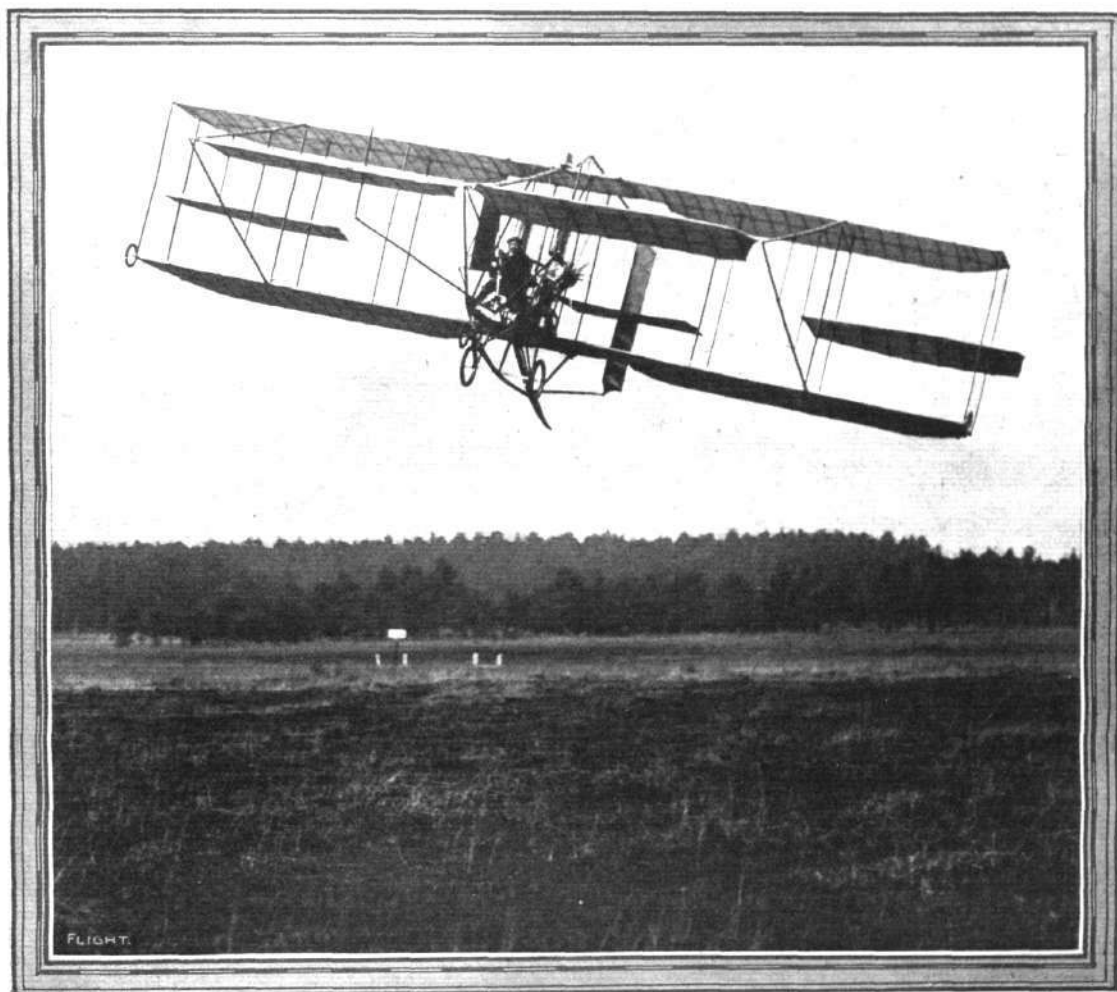
OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

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Mr. S. F. Cody, on his biplane, competing for the British Michelin Cup at Farnborough Friday of last week. Mr. Cody made a magnificent flight, remaining up for 2 hrs. 24 mins. Mr. Cody also intends to put in a journey for the Baron de Forest Cross-Channel Distance Prize in good time before the worst of the winter weather sets in.

THE WAR OFFICE AND AEROPLANES.

ONE of these days the War Office will do something that meets with the approval of everyone—and then the end will come. For a long time the military authorities have had it rubbed into them that they are lagging hopelessly behind the nations in their development of aeronautical science in its application to the purposes of war. Not only were they doing nothing themselves, but they gave no assistance to private experimenters—indeed, quite the reverse, for the inventor who went to them with an experimental flying machine was regarded as having a bee in his bonnet. Well, now that the War Office has shown a disposition to wake up, and has really done something at last, the critics are up in arms against the responsible officials, and are busy laying down what ought to have been done and how it should have been accomplished. The War Office bought the Clement-Bayard. True, they justified their action by haggling somewhat over the price, and bought it for less than they were asked to pay, but even this does not satisfy, for they ought never to have touched it until it had passed all the tests laid down when the dirigible had yet to prove itself a reasonably practical proposition.

For ourselves, we hold that the War Office was perfectly right in acquiring the Clement vessel, for even supposing that she is not a perfect craft, she is one of the best of the non-rigid type extant, and one of the very few in existence. Even were she not potentially serviceable in any other direction, she forms a valuable link in development for the British aerial staff, and enables them to continue where others have left off, instead of having to do *all* the spade work for themselves. We are not concerned with any defects there may have been, other than in design. Possibly, some details were not altogether as they might have been, but that does not alter the main contention we have already advanced. The arguments we have heard mooted against the action of the military authorities regarding the purchase of this vessel are merely worthy of the bargain-counter, and may therefore be dismissed as too flimsy to require serious answer.

Now it is the turn of the aeroplane. The War Office having purchased two machines, a Farman and a Paulhan, are being taken to task, as Mr. Holt Thomas points out in our correspondence columns, for not having bought British machines. It seems to have been urged that there are British manufacturers who are making machines of these types—dead copies, in fact—and that from patriotic motives alone these copies should have been bought instead. But here again we are in agreement with the responsible authorities. We yield to no one in the quality of our patriotism, and it is precisely for this reason that we endorse the policy of the authorities. In order to get a sound footing, our army needs to be equipped with the approved best types of machines. Far be it from us to say that no British copy is equal to a French original, if it be really true that any firm in this country is making such a thing as a slavish copy without licence from those who have risked their lives and expended their brains upon developing their design up to a practical point. We prefer to think that our British manufacturers who are building aeroplanes of similar or approaching type to the Farman, let us say, are doing so with precisely the same objects in view that the War Office has in mind in purchasing the best types to be had for money—to get a starting point for their own improvements. Nothing but the best is good enough for this

purpose; and the military authorities have done the right thing as the development of the heavier-than-air machine stands to-day. To-morrow the case may be different and we may have an improved—and, what is better, a proved—British machine which will lead the world. Until then the world must be searched for all that is best at the moment, so that it, too, may be acquired irrespective of its origin or of whose feelings are injured in the transaction. One point, and one point only, we think the authorities might insist upon as soon as questions of time and delay render reasonable such a course, and that is that the machines they buy should be *built* in this country by those who own the designs. There is no real hardship—and no suggestion of pilfering—in making such a stipulation, while no vestige of excuse would remain for those who plead patriotic sensitiveness to secure a hearing for their chronic growls.

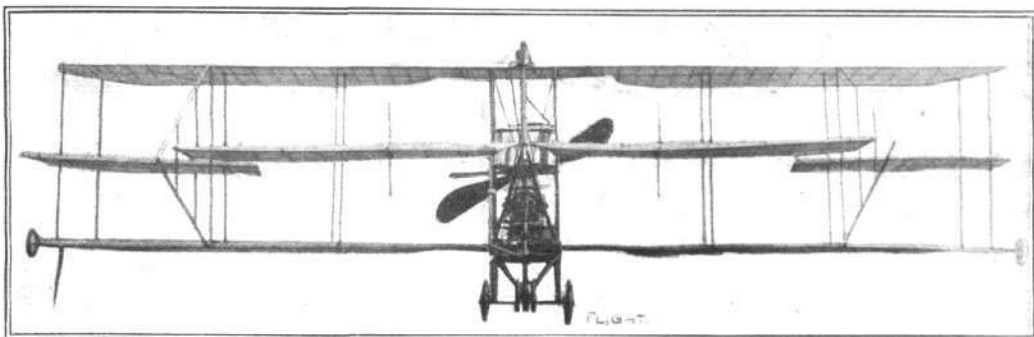
In this connection, the conditions just laid down by the French Minister of War to govern the conduct of a Concours d'Aeroplanes Militaires, to be held a year hence, are most interesting and illuminating. The trials, which are to be held for the purpose of demonstrating the best types of aeroplane for military purposes, are to be open to the world, both as to the machines themselves and the men who navigate them. One essential condition is laid down, however, which is on the lines of the one just suggested above. The machine may be anything in design; its inventor may come from Patagonia for all the French authorities care, but he must build his aeroplane in France. He is not asked to do it for nothing, either; for, although it would be obviously impossible for the French Army to guarantee to pay the expenses of any and every crank who finds himself "up against" this condition, the prizes offered by the Government are sufficiently good to tempt the practical builder to risk what it will cost him to construct his machine in France. The conditions, which are fully outlined on another page, stipulate that machines must be capable of carrying a useful weight of 300 kilogs. and be fitted with three seats. They must first pass through certain eliminating tests in October, after which those which have come through to the satisfaction of the authorities will take part in the final tests which are to take place on the 1st November and following days. There are to be three awards in all. The first prize-winning machine will be purchased by the French Government for £4,000; and its makers will receive an immediate order for ten similar aeroplanes at a price of £1,600 each, with an additional premium of £20 per machine for each kilom. per hour in excess of 60 attained by the winner in the speed-tests, up to a maximum of 80 kiloms. per hour. A simple calculation will show that the winning machine can quite possibly bring its makers in a total purchase figure of £24,000. As second award the maker of the machine gets an order for six machines at £1,600 each, with a similar speed bonus, so that the maximum amount he stands to get is £12,000; while for the winner of third place there is an order to be given for four machines at the same price, and under similar conditions, making the highest possible amount to be obtained by him £8,000.

Under these ideal conditions the French Army will secure twenty of the best machines in the world; built in France. We commend the principle of these trials to our own War Office as being quite the best method of procedure that has yet been proposed.

THE CODY BIPLANE.

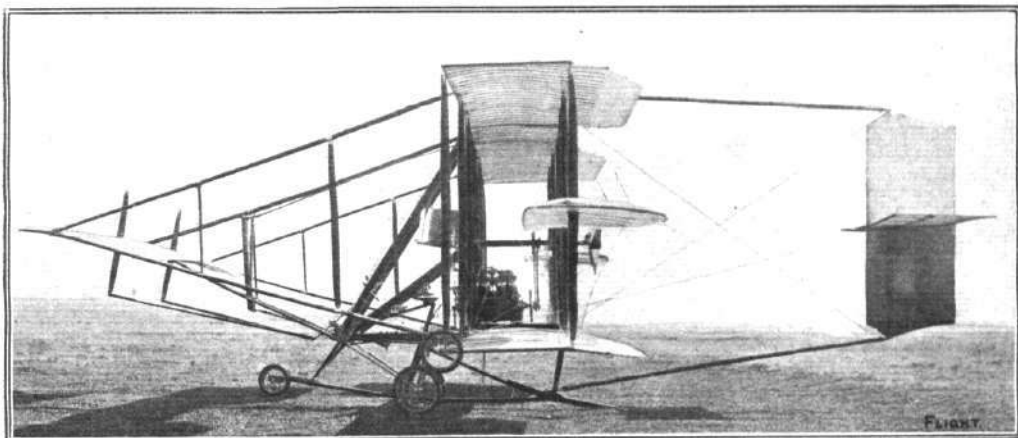
AMONG pioneers in aviation S. F. Cody deserves much credit. He has fought an up-hill fight against great odds, and he has forced success to come to him as a reward not only for perseverance but for real original work. Alone among the designers of aeroplanes

has he succeeded in building a really large machine, and if there are some who have been wont, facetiously, to call it the "flying cathedral," nevertheless, their humour is born of admiration, for the machine does fly, and in the hands of its designer oftentimes



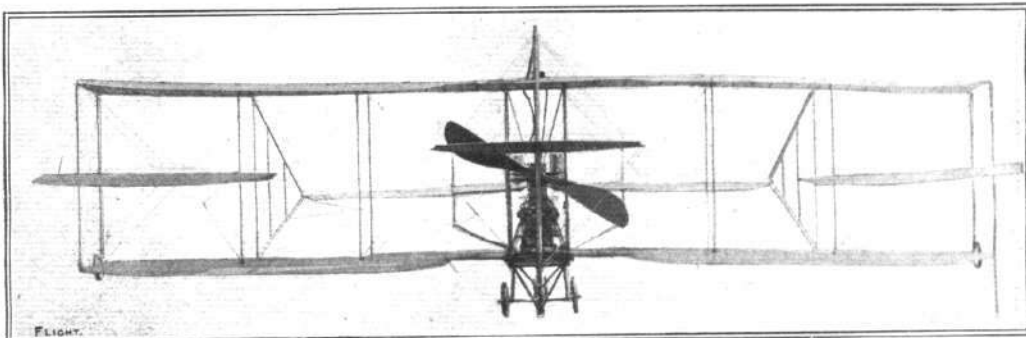
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Front view of the Cody biplane, showing the inverted dihedral of the main planes, the extremities of which drop nine inches below the centre.



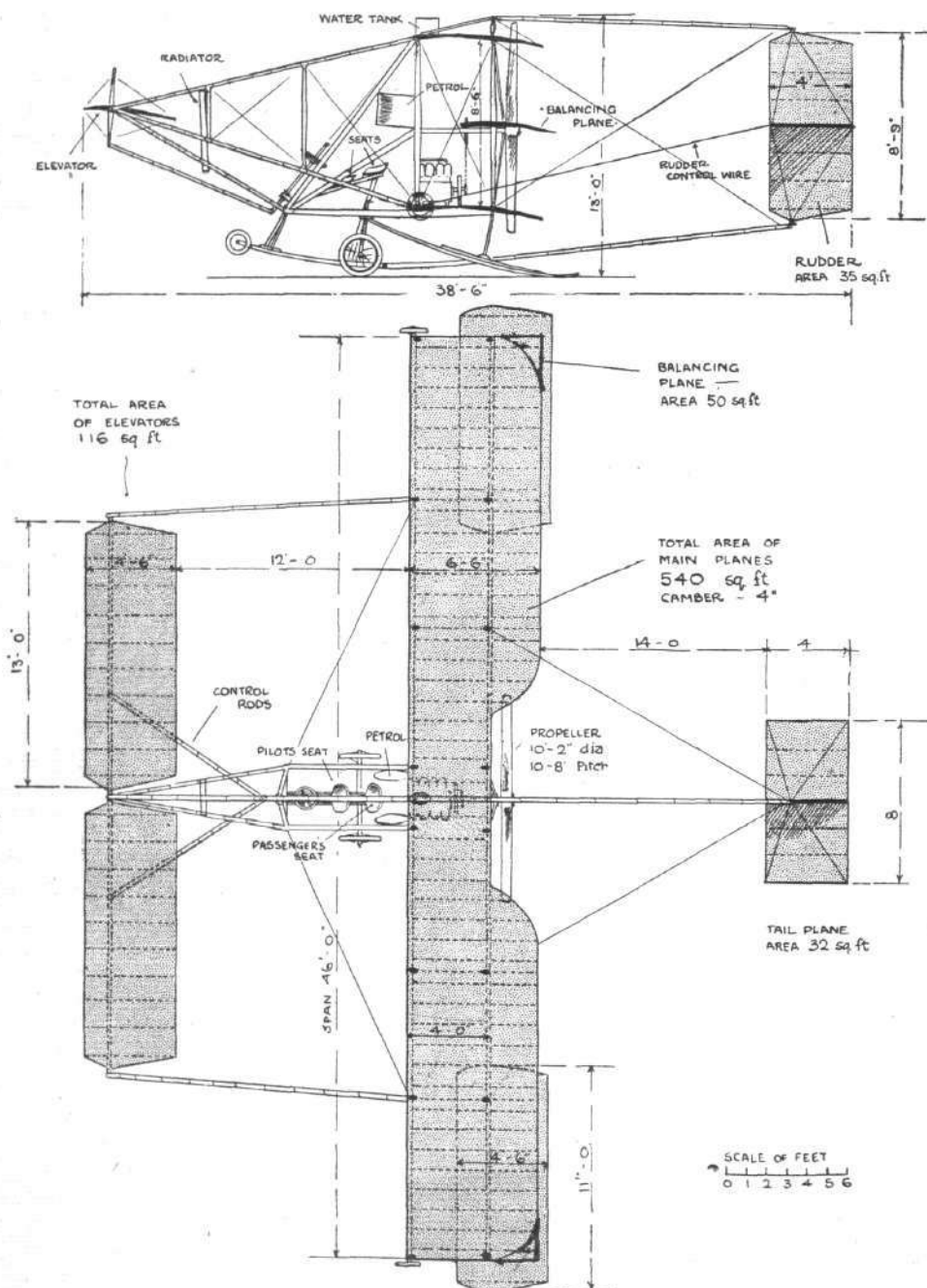
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Side view of the Cody biplane, showing the arrangement of the under-carriage. Guard wheels are fitted to the extremities of the main plane.

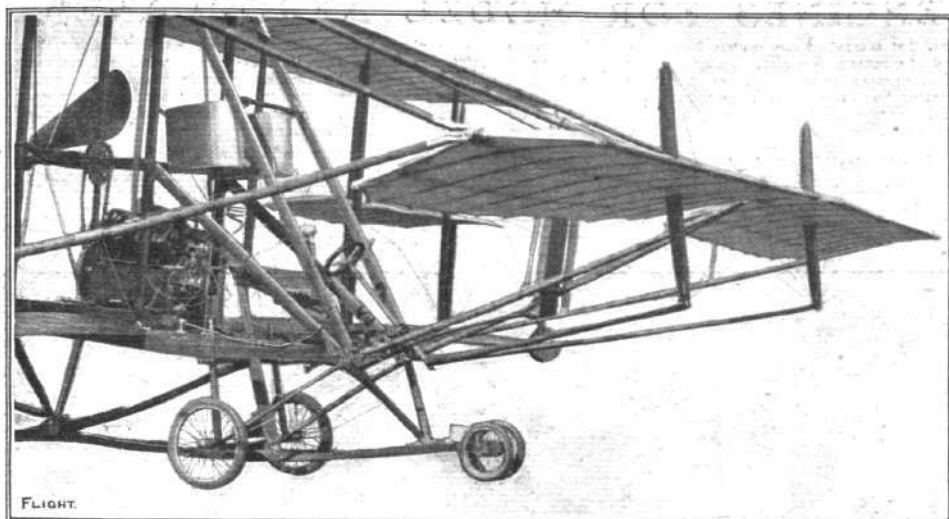


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Rear view of the Cody biplane.



The Cody biplane.



General view of the elevator on the Cody biplane.

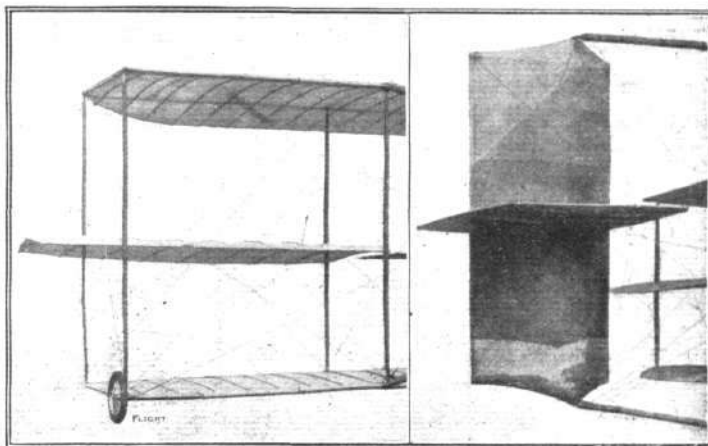
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performs remarkably well. This particular department of design—the large-sized aeroplane—S. F. Cody has made particularly his own, and he intends to devote the greater part of his private time to its further development, although now that he has decided to place his machine on the market commercially, the standard models will be built on smaller lines. Two sizes have so far been decided upon, the smaller of which, fitted with a 30-35-h.p. engine, will be sold for £1,000, and the larger, fitted with a 50-60-h.p. engine, for £1,200. In both cases flights will be guaranteed, and the purchasers will be trained as pilots free of charge, or they can have a professional pilot trained for them if they do not wish to control the machine themselves. So far, however, we have yet to meet the sportsman aviator and his paid chauffeur—he is a type unborn—but he will put in an appearance later on, sure enough.

From a practical point of view, the Cody biplane is remarkable mainly for its strength. It is subjected to very severe strains on Laffan's Plain, over which Mr. Cody has secured flying rights, and the starting ground itself is uneven enough to give a great machine like this a very severe jolting. It is, therefore, to the undercarriage that the eyes of the engineer are almost inevitably directed after he has taken in at a glance the general proportions of the structure that it has got to carry. The chassis in question is an interesting and ingenious piece of work; it supports the machine on the ground by the aid of two pneumatic-shod wheels and a trailing skid arranged "kangaroo-tail" fashion. Between the wheels and joining the trailing-skid is a single central skid that normally remains about 8 ins. clear of the ground. The trailing-skid is reinforced by a top batten, so that it is to all intents and purposes a laminated structure, for all the time that the machine is running over the ground it is constantly pressing on the surface, and acts as a very useful brake after a descent. The main central skid only comes into action if the landing has been so forced as to result in a severe shock, in which case the wheels rise against the pressure of their long helical springs, and allow the full weight of the machine to be directly borne upon the skid. On one occasion quite recently a forced descent was made, and the machine charged a fallen tree trunk. The upturned end of the skid, which is provided with a

pair of small wheels, cleared the trunk, and the entire machine glissaded bodily over the obstacle without doing any damage to the chassis, and not very much to the tree itself. Supported above the under chassis are two horizontal bearers to which the spars of the lower main planes are attached, and immediately above these again come two other bearers of less span, which carry the engine. The engine thus rests centrally upon the lower main plane, and it drives the large single propeller by means of a chain.

Directly in front of the engine, and about on a level with the cylinders, is the passenger's seat, for the Cody biplane is essentially



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On the left one of the balancing planes on the Cody biplane, and on the right the tail of the Cody biplane. The horizontal tail plane is rigidly fixed to the rudder, and moves with it.

a passenger-carrying machine, while in front and a little below the passenger's seat is the pilot's seat. Both are of the pressed-steel kind commonly employed on agricultural machines, and it has often been rather a surprise to us that Mr. Cody has not provided something a little more luxurious for his own comfort; the passenger can, at any rate, hold on to the framework until the machine is safely in the air.

(To be concluded.)

ENGINES FOR MODEL AEROPLANES.

REALISING that several of our readers have been anxious to try their hand at constructing models on a sufficiently large scale to be equipped with proper mechanical power plants instead of the usual elastic "motor," we have prepared the following series of illustrations and descriptions in order to show what engines are already on the market for this purpose.

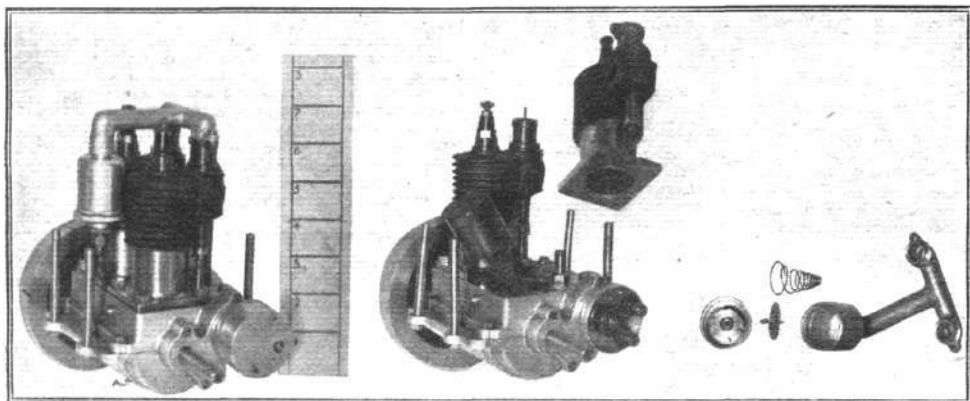
The Davies Two-Cylinder Model Engine.

Two-cylinder model petrol engines are relatively uncommon, and not generally available in very low powers, and that constructed by J. Davies, of Rugby, derives additional interest from the fact that it is only rated at $\frac{1}{2}$ -h.p., and only weighs $4\frac{1}{2}$ lbs. It is a particularly

situated in the cylinder-head, and lies between the two valves. The crank-case is an aluminium casting, divided vertically. The engine weighs $8\frac{1}{2}$ lbs., but a smaller model developing $\frac{1}{4}$ -h.p. weighs only $4\frac{1}{2}$ lbs. This latter model has a bore and stroke of $1\frac{1}{2}$ ins. The $\frac{3}{4}$ -h.p. model is a two-cylinder horizontal engine, and is fitted with Bosch H.T. magneto ignition.

The Automobile and Aerial Supply Co.'s Model Petrol Engines.

Several sizes of small petrol engines, specially designed for use with model aeroplanes, are supplied by the Automobile and Aerial Supply Co. These engines are air-cooled and develop from $\frac{1}{4}$ -h.p. to $1\frac{1}{2}$ -h.p., running at 2,500 r.p.m.



THE DAVIES 2-CYL. MODEL PETROL ENGINE.—On the left general view. The scale set alongside gives some idea of its dimensions. In the centre the engine with one of the cylinders removed, and on the right details of the mixing-valve carburettor fitted to the Davies 2-cyl. model petrol engine.

well-finished job, and the cylinders are made of cast iron, and have a bore and stroke of $1\frac{1}{8}$ ins. by $1\frac{1}{2}$ ins. Each cylinder is a separate casting, and has a valve pocket on one side that contains the atmospheric inlet valve above the mechanically operated exhaust. The crank-chamber is an aluminium casting made in halves, and one end carries a casing enclosing the gear wheels that drive the cam-shaft.

On the end of the cam-shaft is an ignition commutator. The cranks of the steel crank-shaft are set at 180 degrees, and the shaft is mounted on three phosphor-bronze bearings. A mixing valve carburettor is fitted, and the ignition plugs are set centrally in the cylinder-heads.

The Cochrane Model Petrol Engine.

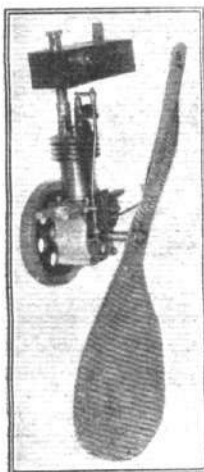
Several different sizes of model petrol engines are supplied by Cochrane and Co., with powers ranging from $\frac{1}{4}$ -h.p. to 3 -h.p. The engine shown in the accompanying illustration is a $\frac{3}{4}$ -h.p. model, capable of running at a speed of 2,000 to 2,500 r.p.m. It has a single air-cooled cylinder, of which the bore and stroke are $1\frac{1}{2}$ ins., and a special feature is that the cylinder-casting is machined outside as well as inside in order to ensure accuracy. The inside is ground after machining for the same reason, a refinement that is not given to most model engines.

The crank-shaft is mounted on phosphor-bronze bearings, and the cylinder head is fitted with an atmospheric inlet-valve and a mechanically-operated exhaust. The ignition plug is also

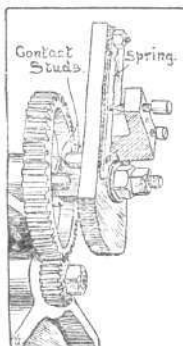
The principal dimensions of these engines are as follows:—

$\frac{1}{4}$ -h.p.	1 cyl.	$1\frac{1}{2}$ in. bore.	$1\frac{1}{2}$ in. stroke.	Weight, 4 lbs.*
$\frac{1}{4}$ "	1 "	$1\frac{1}{2}$ "	$1\frac{1}{2}$ "	6 "
$\frac{1}{2}$ "	2 "	$1\frac{1}{2}$ "	2 "	8-9 "

* Without fly-wheel.



General view of a $\frac{3}{4}$ -h.p. Cochrane model engine fitted with fly-wheel, petrol tank and Cochrane aluminium propeller.

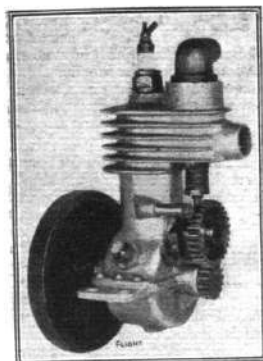


Sketch showing the simple contact-breaker of the $\frac{1}{4}$ -h.p. petrol engine made by the Automobile and Aerial Supply Co., for model aeroplanes.



A $\frac{1}{4}$ -h.p. petrol engine for model aeroplanes, supplied by the Automobile and Aerial Supply Co.

The $\frac{1}{4}$ -h.p. model is the subject of the accompanying illustration, which shows very clearly its simplicity in design. It will be noticed that the valves and sparking-plug are all in the cylinder-head, which is partially spherical. The inlet-valve is atmospheric, and the exhaust-valve is mechanically operated by an overhead tappet. An aluminium crank-case is fitted, which is divided vertically. Four bolts hold it together, and suitable fixing brackets are provided for securing the engine to the aeroplane.



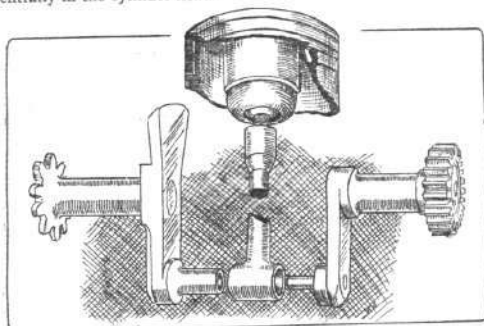
An interesting $\frac{1}{2}$ -h.p. petrol engine for model aeroplanes, manufactured by Charles B. Timperley. The cylinder is of aluminium with a steel liner. It only weighs 4 lbs. 5 ozs. complete with the flywheel.

The contact-breaker is simple in design, and is shown separately in the accompanying sketch. Coil and accumulator ignition and surface carburettors are used on these engines.

C. B. Timperley's $\frac{1}{2}$ -h.p. Model Petrol Engine.

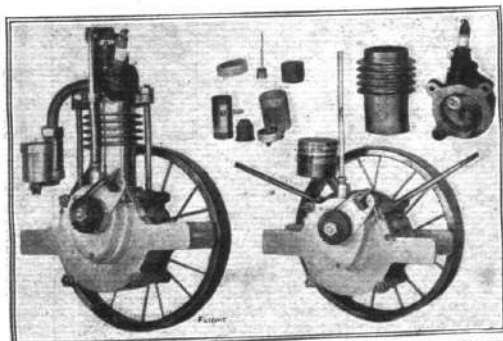
A model petrol engine that is full of ideas in design and construction is that constructed by C. B. Timperley, and illustrated in the accompanying views. It has been designed for lightness, and appears to have achieved that end. Although it is rated to develop $\frac{1}{2}$ -h.p. at 3,200 r.p.m., it only weighs 4 lbs. 5 ozs. This lightness results, in the first place, from the use of an aluminium cylinder, which is cast in one piece with the other part of the crank-chamber, and has a thin steel liner to form a working surface for the piston. The atmospheric inlet valve and the mechanically-operated exhaust are carried in a chamber protected from the side of the casting. The ignition plug is situated centrally in the cylinder head.

jecting from the side of the casting. The ignition plug is situated centrally in the cylinder head.



Sketch showing the construction of the crank-shaft of the Timperley engine. At the top is shown the ball and socket small-end bearing.

Another striking feature of this little motor is its divided crank shaft. The joint occurs in the crank-pin, which is made in duplicate, but of different diameters, so that the two parts may telescope together. Incidentally, this enables the big end of the connecting-rod to be made in one piece, for the divided crank-pin allows it to



A well-built $\frac{1}{2}$ -h.p. petrol engine, manufactured by H. W. Porter, the main feature being the large flywheel with wire spokes. On the right is the engine with the cylinder and cylinder-head removed. The carburettor is also shown dismantled.

be threaded in place. Yet another original detail of construction is the ball-socket joint which does duty for a gudgeon-pin as a means of fastening the connecting-rod to the piston, and these details are very clearly illustrated by one of the accompanying sketches.

The Porter Model Petrol Engines.

The small and well-built petrol engine illustrated herewith, that is manufactured by H. W. Porter, develops $\frac{1}{2}$ -h.p. at 2,000 r.p.m. and has an air-cooled cylinder $1\frac{1}{2}$ ins. bore by 2 ins. stroke. The weight, complete with flywheel, is about 11 lbs.; without the flywheel it weighs about 5 $\frac{1}{2}$ lbs. The cylinder-head, which contains the valves and ignition-plug, forms a separate casting from the cylinder, being held down on to the latter by two long bolts from the crank-case. It will be seen that the aluminium crank-case is divided vertically and held together by four bolts, the two top bolts also forming hinges for those that secure the cylinder-head in position.

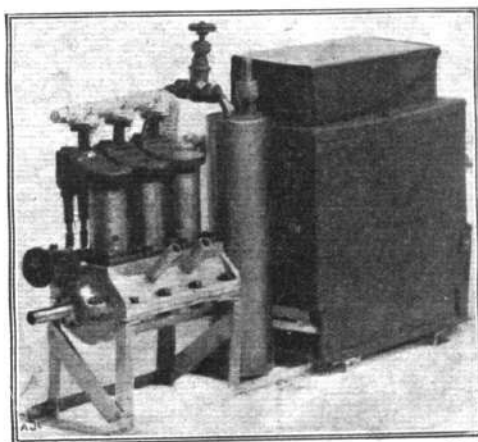
The crank-shaft is of forged steel, and the timing wheels are cut from the solid. Hard brass is used for the bearings. An atmospheric inlet-valve is fitted, and the exhaust-valve is mechanically operated on the overhead principle. Three piston-rings are fitted to the piston, one of these being twice the width of the other two. A distinctive feature of this engine is the flywheel, which consists of a heavy cast-iron rim having wire spokes; a large diameter flywheel—8 ins. diameter in the $\frac{1}{2}$ -h.p. model—with minimum weight is thus obtained. A very small float-feed type of carburettor, having an extra-air valve, and weighing 4 ozs., is fitted. This carburettor is shown dismantled in the illustration of the engine with the cylinder and cylinder-head removed. Coil and accumulator ignition is employed with this model, and with the two-cylinder engines a high-tension distributor is fitted so as to enable one coil only to be used. Four sizes of engines, including the above, are made as under:—

$\frac{1}{2}$ -h.p. ...	$1\frac{1}{2}$ ins. bore.	2 ins. stroke.	Weight, 11 lbs. *
$\frac{3}{4}$ " ...	2 " "	2 " "	" 11 $\frac{1}{2}$ " *
1 " ...	2-cyl. $1\frac{1}{2}$ " "	2 " "	" 15 " *
$1\frac{1}{2}$ " ...	2 " "	2 " "	" 15 $\frac{1}{2}$ " *

* With flywheel.

The Sphinx $\frac{1}{2}$ -h.p. Steam Plant for Aeroplanes.

Most engines for models are petrol motors, and thus the little steam plant constructed by the Melton Aeroplane Co. is out of the ordinary in principle, apart altogether from the fact that it possesses



A compact little $\frac{1}{2}$ -h.p. steam plant, supplied by the Melton Aeroplane Co., for model aeroplanes. It weighs 4 lbs. 2 ozs. complete with fuel and water.

a distinct interest of its own as a steam system. The plant complete is shown in the accompanying photograph, and consists of a 3-cylinder engine, having mechanically operated valves of the petrol engine type. The cylinders, crank-chamber, and outside gearing for driving the cam-shaft all strongly resemble petrol engine construction. The remainder of the plant consists of a generator and water tank, the latter being in the form of a cylinder and fitted with a tyre-valve attachment, so that its contents can be put under pressure by inflation with an ordinary tyre-pump. The water in the cylinder is thus fed to a flash-type generator, constructed of seamless drawn steel tube; it is contained in a light steel casing

lined with asbestos. When starting the plant the generator-tube is first heated with a blow lamp, which also puts in operation the charcoal furnace. It is fed from a little hopper on the top of the boiler casing, containing little nuts of this fuel.

The generator is capable of supplying steam to run the engine with an 18 in. diameter two-bladed propeller, having a 2 ft. 7½ in. pitch, at a speed of 1,400 r.p.m.

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BRITISH NOTES OF THE WEEK.

Mr. Cody's Try for the Michelin Prize.

ALL who have the interests of British aviation at heart will join in congratulating Mr. S. F. Cody on the magnificent performance which he accomplished on Friday of last week. Using his all-British machine, he rose from the ground just outside his shed, and, officially timed by Capt. Broke-Smith, R.E., and Lieut. Reynolds, R.E., was in the air for 2 hrs. 24 mins., during which he covered 94½ miles at an average speed of over 40 m.p.h. He was then compelled to descend, owing to his supply of lubricating oil having run out, but during the period of the flight the 50-60-h.p. Green engine with which the machine is fitted ran regularly and without a hitch. For the first hour Mr. Cody was flying fairly low, but later on the gusty winds caused him to seek a higher altitude. This flight counts for the Michelin Trophy, the competition for which remains open until the last day of December, 1910. It is the best flight recorded in the competition so far, and our readers will doubtless be interested in the description of the machine, which will be found on p. 923.

The Aeronautical Society Lectures.

THE first of a series of six educational lectures on subjects relating to flight, which have been organised by the Aeronautical Society, was delivered by Mr. J. H. Ledeboer, on Wednesday, November 2nd, at the Northampton Institute. Mr. Ledeboer took as his subject "The Study of Dynamic Flight," and succeeded in delivering one of the most interesting lectures on the general outlines of aviation that have yet been given in this country, and that he succeeded in holding his audience was self-evident from the animated discussion that ensued.

The second lecture of the series will be delivered by Mr. A. E. Berriman on the "Mathematics of the Aeroplane," and takes place on Wednesday next, November 16th, at the Northampton Institute, at 8 o'clock. Each lecture is complete in itself, and is followed by a discussion. Those desiring to attend should write at once for tickets to the Secretary of the Aeronautical Society, 53, Victoria Street, S.W. The Northampton Institute is in St. John's Road, Clerkenwell, a few minutes' walk from Farringdon Street station on the Metropolitan Railway, or from the Rosebery Avenue trams.

Steam pressures up to 250 lbs. per sq. in. are available, and the total weight of the plant is 4 lbs. 2 oz., of which the engine weighs 20 ozs., the generator 24½ ozs., the hopper with its fuel, the cylinder with its water, the frame and all the connections weigh 23½ ozs. A run of 90 secs. duration is available from the two fluid ounces of water with which the tank is charged.

Echo of the Burton Meeting.

A PLEASANT little function took place at Burton-on-Trent on Wednesday of last week, when, at a dinner given by the local Committee which organised the recent flying meeting there, the Mayor and Mayoress were presented with a silver salver and a framed photograph of the Committee. Councillor Tarver, who was Vice-Chairman of the Committee, received a silver rose bowl, and Mr. Arnold also was presented with a silver salver. In addition to these souvenirs a chain of office has been purchased, which will be worn by future Mayoresses of the Borough. The presentations were made by Mr. S. H. Evershed, who thanked the recipients for the way in which they had worked to make the aviation meeting at Burton a success.

Tottenham Follows the L.C.C.

SOME time ago the Tottenham Council were considerate enough to grant permission for some aeroplane experiments to be carried out over the Marshes, but apparently owing to their desire to emulate the London County Council as a body of encouragement, they have now withdrawn their permission.

Paint for Fabrics.

THE Accordion Boat Co. have sent us specimens of fabrics treated with their special paint, and the preparation in question may be of interest to many of our readers who are doing their own constructive work. The paint can be applied for waterproofing the fabric after the fabric has been stretched on the planes, and it is also very useful for re-dressing planes if they have been damaged. Lengths of painted fabric can also be supplied if desired. It is light yellow in colour, and fabric thus treated is not unlike oiled silk in appearance. It is quite flexible, and, in fact, the term paint is rather a misnomer so far as appearances go, for the fabric appears to be quite saturated with the preparation, which is in no way like the ordinary superficial covering that the idea of paint suggests.

The Gordon-Bennett Winner.

IT is interesting to note that when Mr. Claude Grahame-White won the Gordon-Bennett Aviation Trophy at Belmont Park, on the 29th ult., he used Shell motor spirit.



M. Prier, chief instructor at the Blériot Aviation School at Hendon, landing with a fine vol plane at the "Scrubs" last week in connection with his flight on a Blériot monoplane from the Hendon flying grounds to Wormwood Scrubs and back, in order to give Mr. Willows greeting prior to his start on his airship for France and Paris.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

Committee Meeting.

A MEETING of the Committee was held on Tuesday, the 8th inst., when there were present:—Mr. C. F. Pollock (in the Chair), Mr. Griffith Brewer, Mr. Ernest C. Bucknall, Col. Henry C. L. Holden, R.A., F.R.S., Prof. A. K. Huntington, Mr. V. Ker-Seymer, Mr. F. K. McClean, Mr. J. T. C. Moore-Brabazon, Mr. Stanley Spooner, and Harold E. Perrin, Secretary.

New Members.—The following new members were elected:—

Robert Davidson. Denys E. Pridaux-Brune.
Capt. Duncan Grant-Dalton. Marshall Field Robinson.
A. A. Dashwood Lang.

Aviators' Certificates.—Aviators' Certificates were granted to the following:—

24. J. D. Weir.
25. Lieut. Hugh E. Watkins.

"Daily Mail" £10,000 Prize and Gordon-Bennett Aviation Cup.—The following sub-committee was appointed to take in hand the preliminary arrangements for the above competitions:—

Mr. Griffith Brewer. Mr. J. T. C. Moore-Brabazon.
Mr. Ernest C. Bucknall. bazon.
Col. H. C. L. Holden, R.A., F.R.S. Mr. Mervyn O'Gorman.

Rolls Memorial Fund.

A meeting of the Joint Committees of the Royal Automobile Club and the Royal Aero Club was held at the Royal Automobile Club on Thursday, November 3rd. The resolution of the Executive Committee of the Royal Automobile Club recommending that the subscriptions received by them should be handed over to the Royal Aero Club to assist in the establishment of a Rolls Memorial Aeronautical Library, was adopted. The thanks of the Royal Aero Club were tendered to the Royal Automobile Club for this generous gift.

Rolls Memorial Fund.

Members who have not yet sent in their contributions to the above Fund are requested to do so as early as possible. By limiting individual subscriptions to the sum of 10s. the Committee hope they will receive the support of all members.

It has been decided that the Memorial shall take the form of a bas-relief plaque, and that any surplus over and above the cost of the Memorial shall be devoted to the establishment of an Aeronautical Library at the Royal Aero Club, to be called the "Rolls Memorial Library."

Contributions of books to the "Rolls Memorial Library" will also be greatly appreciated.

A list of subscriptions received up to the 2nd inst. was published in the last issue, and the following have since contributed up to the 9th November, 1910:—

A. E. Berriman, Lt. H. F. Burke, R.A., C. G. Grunhold, Norman C. Neill, Ferdinand Prior, Capt. Walter N. Wells.

British Empire Michelin Cup.

Mr. S. F. Cody, on the 4th inst., made a flight of 94½ miles at Laffan's Plain, Aldershot, in connection with the above prize. The flight was observed by Captain P. W. L. Broke-Smith, R.E., and Lieut. H. R. P. Reynolds, R.E. This is the longest distance so far recorded in the competition, which for the year closes on December 31st, 1910.

Aero Exhibition, Olympia, 1911.

The Society of Motor Manufacturers and Traders has decided to organise an International Aero Exhibition at Olympia, under the auspices of the Royal Aero Club, in March, 1911. Full details will appear later.

Baron de Forest £4,000 Prize.

Intending competitors are reminded that it is necessary to give one month's formal notice of entry, and that the competition closes on December 31st, 1910.

The following formal entries have been received by the Royal Aero Club, and are set out in order of receipt:—

George A. Barnes.	H. J. Harding.	E. V. B. Fisher.
J. T. C. Moore-Brabazon.	T. Hansome.	Lieut. H. E. Watkins.
Eugene V. Gratze.	Lieut. J. W. Seddon,	kins.
C. Grahame-White.	R.N.	J. Neale.
S. F. Cody.	R. F. Macfie.	Alec Ogilvie.
G. C. Colmore.	W. Fairbrother.	Charles Collyer.
J. Neil Campbell.	A. Grattan Power.	T. Sopwith.
Bertie Rippin.	Leo Jezzi.	E. Smith.
Capt. Bertram Dickson.	F. K. McClean.	A. H. Boulton.
R. Wickham.	Edward Mines.	E. A. Paul.
D. Graham-Gilmour.	H. Barber.	W. E. McArdie.
Cecil S. Grace.	O. C. Morison.	Sam Carter.
A. C. Hunt.	J. Hirst.	H. Pixton.
	Robert Loraine.	A. V. Roe.
	F. Raynham.	S. B. Bignold.

Eastchurch Flying Ground.

For the convenience of Members, the best train is the 9.45 a.m. from Victoria, arriving at Queenborough 10.55. At Queenborough change to the Sheppey Light Railway for Eastchurch, which is ½-mile from the flying ground.

Railway Arrangements.—The following reduced fares have been arranged with the railway company for members visiting Eastchurch:—

1st Class return, 8s.; 2nd Class, 6s. 6d.; 3rd Class, 5s.

Tickets available for one month from date of issue.

Members desiring to avail themselves of these reduced fares are required to produce vouchers at the booking offices. Vouchers can be obtained from the Secretary of the Royal Aero Club. Trains leave Victoria, Holborn, or St. Paul's.

HAROLD E. PERRIN,
Secretary.

166, Piccadilly.

PROGRESS OF FLIGHT ABOUT THE COUNTRY.

NOTE.—Addresses, temporary or permanent, follow in each case the addressed direct to the Secretary. We would ask Club Secretaries in FLIGHT, 44, St. Martin's Lane, London,

Aeroplane Building and Flying Soc. (8, MANCHESTER ST., W.).

ON Saturday week the members of the society successfully transported the club glider from the workshop at Hammersmith to the ground at Kensal Rise, where the gliding hill is now set up, much to the astonishment of the inhabitants. The glider reached its new quarters without accident, though it had to be entirely taken to pieces to allow of its coming out of the workshop. Arrived on the ground, six of the members soon had it together, and it was safely housed under three huge tarpaulins before the vile weather of the first part of the week commenced. Experiments with the trolley on the gliding hill show that it is possible to get up a speed of 50 m.p.h. by the time the bottom of the hill is reached. The glider should rise at 30 m.p.h., so that there is every prospect of getting a lift about half way down. The trolley has not yet been right up to the top of the slope, as it has been

found that the means employed to check it at the bottom are inefficient. This is now being altered, and the next move will be to erect either a tent or a shed in which the machine can be housed while it is being covered. The latest suggestion is to make a real flyer of it, by fitting it with a 3½-h.p. motor cycle engine, which one of the members has promised to lend. The thrust of this, transmitted through a propeller of new design, and aided by the send off of the gliding hill, should enable quite a respectable flight to be obtained.

Amateur Aero Club (KINGSTON-ON-THAMES).

This club has only lately been formed, and is intended specially for youths residing at Kingston-on-Thames and district. The first meeting has already been held, and all that is now wanting is an influx of members. The subscription has been fixed at 2s. per year,

and all prospective members are invited to apply for further particulars to C. Menzies, 36, Cromwell Road, Kingston-on-Thames.

A Model Aero Club for Sheffield.

It is proposed to form a model aero club in Sheffield, so that members may construct models and have flying meetings for prizes in the summer months of next year; also to study the sport and science of aviation and aeronautics. Anyone desirous of becoming a member is invited to communicate with C. F. W. Cudworth, 35, Penrhyn Road.

Conisborough and District Model Ae. Soc. (18, Church St.).

A GENERAL meeting was held in the club room at the above address on Friday, November 4th, when it was decided that members should meet the following day for the purpose of inspecting a proposed workshop in Wellgate. Four new members were elected. Mr. J. I. Webster was elected assistant secretary, and Mr. J. E. Greathead was chosen to be captain, and overseer of the glider.

After the inspection of the proposed workshop, it was decided not to take it till a few other places had been inspected.

East London Aero Club (37, Tunmarsh Lane, Plaistow, E.).

THIS club has been successfully inaugurated with the object of promoting the science and sport of aviation. There is every possibility of the club quickly assuming considerable proportions, the district being such a large one. Intending members should apply at once to Ernest Sissons (hon. sec.) at above address, for full particulars, as the winter session is just about to be commenced.

East London College Ae. Research Soc. (Mile End Road, E.).

A VERY interesting and instructive paper upon "Aerial Photography" was read before this society on Thursday, October 27th, by Mr. A. G. Field, the well-known photographic expert.

The lecturer gave a short historical *résumé* of his subject, and then proceeded to deal with some of the difficulties encountered by the operator. The usefulness of aerial photography to military reconnaissance was dealt with, and Mr. Field clearly proved the practicability of surveying a district by its aid. In response to the unanimous request of the meeting the lecturer very kindly consented to repeat his lecture on some convenient date in December next.

The next public meeting of this society will be held on Monday, December 5th, at 8 p.m., when Mr. J. Cousins will read a paper on "Aerial Gunnery."

Intending members can obtain full particulars of the society upon application to the Hon. Secretary, Aeronautical Research Society, East London College, Mile End Road, E.

Manchester Ae.C. (Model Section) (52, Mansfield Chambers).

A LECTURE was given by Mr. W. M. James on Saturday last

on the subject of "Automatic Stability." The lecturer gave detailed descriptions of various automatic stability devices he had invented, illustrating them with lantern slides. These devices included a vertical fin arrangement, a small plane placed above the main ones (in monoplane) for damping the speed of a *vol plane*, and a pendulum control.

A practical turn was given by the lecturer exhibiting a large number of paper gliders, the manoeuvres of which proved very amusing as well as instructive.

Several models were on view illustrating some of the above mentioned ideas, and the audience evinced great interest in the "why and wherefore" of automatic stability.

On November 19th an exhibition of models will be held in the workshop when prizes will be given for construction and originality of design.

Midland Aero Club (Grand Hotel, Birmingham).

THE annual general meeting of this club was held on the 4th inst. at the Grand Hotel, Birmingham, under the presidency of the Lord Mayor (Alderman W. H. Bowater). There were between six and seven hundred people present, including members and their friends. In opening the proceedings, the Lord Mayor congratulated the club upon the position it now held, having a membership of nearly 500 and a balance in hand of £133. He mentioned, too, that almost any day now there was more flying at the club's grounds at Dunstall Park than on any of the days at the flying meeting held at the beginning of the season. Captain J. H. Cooke, Chairman of the Council, presented the annual report, and briefly reviewed the work of the club during the past year. He said that the aviation meetings such as those held during the past year would not be seen again, but cross-country flights, point to point, would take their place. He mentioned that the club during the coming spring hoped to be in a position to organise a series of minor contests across Stanhope Chase, Sutton Heath, and other suitable places. The officers of the club were re-elected as follows: Capt. J. H. Cooke, Chairman of Council; Mr. H. A. Pepper, Honorary Treasurer; Mr. Gilbert Dennison, Honorary Secretary; Mr. C. F. Dawes, Press Steward. After the business meeting was over, Captain Cooke gave an interesting lecture in which he gave his ideas as to the probable development of the aeroplane and the airship, and he ventured to think that the machine of the future would be one which combined the principles of the aeroplane with that of the direct lift machine. Dealing with the attitude of the British Government regarding aeronautics he said we were told to move slowly and that Great Britain was waiting to see the development of the airship. The mastery inactivity left us very much in the rear of neighbouring nations. The possibilities of aviation were not properly appreciated by the public because they were so vast. Personally he had great faith in the future of aeroplanes and dirigibles as passenger carrying machines.

FROM THE BRITISH FLYING GROUNDS.

Brooklands Aerodrome.

WEATHER conditions have not been propitious on the whole during the past week, and aviators have to watch their opportunity. After a stormy day, on Wednesday last week, Mr. Gilmour took advantage of a drop in the wind in the late afternoon to try the 8-cylinder Jap-engined Martin-Handasyde monoplane, but only ventured on straight flights, owing to the controls—the two-wheel Antoinette type—being new to him. Mr. Gilmour has now persuaded Messrs. Martin and Handasyde to alter the controls to the Blériot type, and he has taken the cloche from his own machine for the purpose. It will be interesting to note whether he Blériot control on an Antoinette type of monoplane gives satisfaction. It is well known that the Antoinette controls are difficult for beginners.

One other machine ventured out—the Bristol biplane—with Mr. Low and a pupil.

Friday proved an ideal flying day. The first airman to take advantage of it was Mr. Sopwith, on the Warwick Wright monoplane. Starting with long hops he practised steadily throughout the day, progressing so well that he finished by making circuits of the ground, passing behind the sheds and flying in good style.

In the afternoon Mr. Gilmour, on the "Big Bat," made several passenger trips, and on one occasion took his mechanic for a long flight over Weybridge and the surrounding country, attaining an altitude of nearly 1,000 ft.

Both the Bristol machines were out, the Bristol-Gnome carrying passengers.

One of Grahame-White's British-built Farman, fitted with an E.N.V. engine, was out piloted by pupils, making straight flights.

They showed that they had benefited by their previous experience on the Blériot. Late in the afternoon Mr. Watkins, on the Howard Wright biplane, made two of the three flights necessary to qualify for his pilot's certificate.

Saturday morning saw Mr. Sopwith again practising, but he was obliged to give up owing to a cracked engine cylinder. Mr. Maitland, on the Bristol-Gregoire, met with a mishap. As far as one could judge it was caused by the inside wheels collapsing, allowing the skid to dig into the ground. The skid broke off, and the machine came down on the left side, breaking some uprights as well as the propeller.

While it was stranded in the centre of the ground, good flights were made by M. Edmond and Mr. Low on the Bristol-Gnome.

M. Blondeau was flying his Farman, followed afterwards by his apt pupil, M. Ducrecoq.

Mr. Pixton, on the Roe triplane, who has made rapid progress, executed two very fine flights at a good altitude, and was executing figure eights. Mr. Watkins qualified for his certificate, and Mr. Gilmour, on his Gnome-Blériot "Big Bat," remained in the air for a considerable time.

Tuesday, the 8th inst., proved an eventful day, as a calm afternoon brought out many flyers and would-be flyers; and there were no fewer than three smashes, two of a serious nature. The first ascent was made by Mr. Watkins on his biplane, on which he flew until dark. He also took up a lady passenger for a short flight.

Mr. Macfie was not long in following his example, his machine flying much better than usual and lifting a heavy passenger with

case. M. Blondeau then went aloft for the benefit of a pupil, who had part control most of the time.

Mr. Sopwith was doing exceedingly well on his Warwick Wright monoplane, flying stronger than before owing to a change of propellers. At times he reached an altitude of quite 200 ft. Mr. Pixton, on the Roe triplane, attained about the same altitude, but while over the sewage farm the machine began a rapid descent on an even keel, but taking a spiral path. In the inevitable smash the petrol tank became ignited, and much damage was done to the machine before the fire could be extinguished. Mr. Pixton escaped unhurt, and he was quite unable to give any reason for his fall.

Mr. Low made circular flights on the Bristol biplane, followed by M. Edmond, who carried passengers. Mr. Grahame-White's Farman, piloted by a pupil, made several straight flights.

Mr. Collier brought out his monoplane, now fitted with a 20-h.p. J.A.P., but in a very short space of time he was in difficulties. Owing to an axle breaking, the machine swung round sharply, smashing one of the tail outriggers, but doing no serious damage.

After most of the flyers had retired for the day, Mr. Gilmour took out the Martin-Handasyde monoplane, now fitted with the Blériot controls. While coming up from the far end of the aerodrome, a wheel buckling caused the machine to turn round on a wing tip, and finally stand on its nose. Mr. Gilmour was thrown from his seat, but luckily his foot catching in a wire prevented him from going further than the plane. A propeller, one wing, and the front skid proved the sum total of this little episode.

London Aerodrome.

ON Tuesday of last week, a 50-h.p. Blériot-Gnome having arrived, M. Prier was soon out with her, and flew over the surrounding country at a height of about 700 ft., remaining up about 15 mins. The difference in the way he rose in the Gnome-engined machine compared with the Anzani was most noticeable, and at the end of the flight the engine was little more than warm.

Wednesday and Thursday proved blank days, owing to the boisterous weather. Friday afternoon turned out bright and sunny with a crisp air, and saw M. Prier leave the aerodrome upon a visit to Mr. Willows at Wormwood Scrubs. At exactly 2 p.m. M. Prier climbed into the new 50-h.p. Blériot-Gnome, and examined her; everything being satisfactory, at 2.5 he started the engine and left the ground. Flying at a height of about 1,200 ft., he accomplished the journey to Wormwood Scrubs in 7½ mins., alighting directly in front of Mr. Willows' garage. Here he remained some three-quarters of an hour chatting to Mr. Willows, whom he wished "good luck" on his voyage to Paris, and then again climbing into his aeroplane he returned to the London Aerodrome in 7 mins., attaining a height of some 1,300 ft., from which he descended in one long *vol plané*. He was thus absent from the London Aerodrome about an hour, while his actual flight had taken exactly 14½ mins.

An interesting fact is that the machine used is the first of its kind to be sold on the ground of the London Aerodrome, while it is the first in existence to be purchased for a purely commercial reason, since it was purchased in connection with the laying of oil pipes across a desert in Persia.

Saturday proved another glorious flying day—bright and windless, though a trifle keen. In the morning Mr. Weir, the Blériot pupil—if one who has made such wonderful progress can be termed pupil—flew brilliantly several times, making complete circuits of the ground, at an average height of 30 ft. The astonishing way in which Mr. Weir has learnt to fly should convince even the veriest unbeliever that flying—at any rate, as taught by M. Prier—is within the scope of anyone who wishes to learn.

In the afternoon there was a double attraction; Mr. Weir obtained his R.Ae.C. pilot's certificate as the result of five lessons! He flew the usual test of three flights of 6 mins. each, coming down in a given space of 150 yards. At times he rose to about 100 ft., and at others to some 30 ft.; but, wherever he flew, the wonderful steadiness of the machine was most marked, and very few people, not knowing that he was a pupil, would have guessed that he had only five times previously been in an aeroplane. A wonderful

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Mr. Haldane Ventures Aloft.

REALLY things are coming to a pretty pass when the British War Minister actually visits Aldershot to see what is being done in the way of aeronautics there, and not only so but ventures aloft in a dirigible. It is high time, however, that the authorities did do something to encourage the enthusiastic officers at Farnborough who have for so long been endeavouring to make "bricks without straw," and it is to be hoped that as a result of this visit the ballooning establishment there will be placed on a more liberal footing. After inspecting, on Friday week, the *Morning Post* National Fund Airship, which is undergoing repairs in the big balloon shed at Farnborough, Mr. Haldane witnessed some short

performance, which proves emphatically the boast of the Blériot firm that flying can be easily taught in six lessons!

After Mr. Weir's first flight M. Prier gave a wonderful display of fancy flying in a 50-h.p. Gnome-Blériot; he flew in short circles for some time, and then gave the crowd a taste of his powers by circling the ground, and ending in *vol planés* which apparently looked like a sudden and tragic end to machine and pilot.

During this week the "Valkyrie II" has been undergoing alterations. The big three-seated machine is a source of interest to many, and the impressions regarding her capabilities are many, so that it will be interesting to see the result of her trial. The small machine is nearly finished, and two more are on the way.

New Forest Aviation School.

DURING the three fine days at the end of last week, Barrington Kennett, Cook, Wilson, and Kempton Cannon were busy on the School monoplanes, the first-named couple making excellent flights which would have enabled the pilots to pass their tests for certificates had they arranged for an official observer to be present.

On Friday evening Lord Montagu—one of the honorary observers appointed by the Royal Aero Club—motored up, and Cook at once started off to attempt one of his qualifying flights. Unfortunately, the motor got obstinate, and despite every effort to keep his machine in the air, the gallant Major was obliged to make a sudden landing after having covered about 2 miles. As is so often the case, the spot where he came down was the only place within hundreds of yards that is not entirely free from "hazards." Just in front of him was a gaping dry pond; the machine actually ran in and out of it again, despite the fact that the banks are 3 ft. high and extremely steep, ere coming to a standstill with a smash. Considering all things it was extraordinary that only the propeller and a longitudinal of the fuselage were broken, but the delay made it too late for another trial to be attempted before sunset.

Kempton Cannon has more than realised the expectations expressed in these notes three weeks ago, for from the first moment he got into a machine he seemed to get the "touch" of the control and rudder. Exactly following instructions he used very little helm, got his tail up nicely, and for his first essay made a roll of about half a mile in a perfectly straight line. He seems to have experienced no difficulty in either keeping his head or in keeping the machine straight, and on the second day he was doing straight hops. Given a little more fine weather, his rapid qualification as a pilot-aviator looks certain.

There is little doubt that his thorough knowledge of motors stands him in good stead, but light hands, ready resource, and quickness of action inherent in a good jockey, probably contribute more towards his astonishing aptitude for aviation than anything else.

Salisbury Plain.

ON Wednesday Mons. Tétard, the noted French pilot, was flying the Bristol biplane with E.N.V. engine, making several fine circuits of about 10 miles, afterwards flying on the Bristol No. 9 (Gnome engine). Mons. Jullerot also made two good circuits with the E.N.V. biplane. Mr. McDonald, one of the school pupils, then made several flights. He has improved so steadily that he is now quite ready to take his certificate any suitable day. On the 4th inst. he made seven separate flights with the Bristol E.N.V., covering in all about 60 miles. His longest single flight without touching the ground was 16 miles, flying towards Devizes and back to the hangars, a good cross-country flight, finishing with a *vol plané* and landing from about 50 ft.

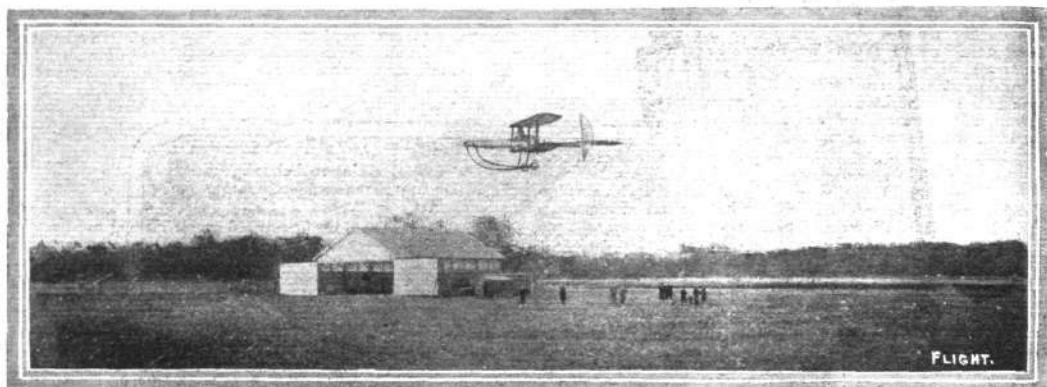
M. Tétard was also out on this day early in the morning on No. 9.

On the 5th inst. McDonald was at 6.30 a.m. out again, making a few short flights, but the cold was terrible, there being a very hard frost during the previous night, preventing him staying in the air for more than 5 minutes at a time. M. Tétard flew with the No. 9 machine at 12.30, being up for 15 minutes, and reaching an altitude of 1,000 to 1,200 ft., and landing with a very pretty *vol plané*. He also complained of the intense cold. It must be gratifying to the constructors of the Bristol to know that both M.M. Jullerot and Tétard speak highly of the stability and flying qualities of the machine, and of their great confidence when flying this machine.

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flights by the airship "Beta," and so impressed was he that he decided to make a short trip himself. Changing his frock coat and "topper" for a more workmanlike coat and a cap, he took his place beside Capt. Broke-Smith, while Mr. Cox took charge of the engine room. On being released the vessel rose to a height of about 400 ft. and cruised over Laffan's Plain for about 20 mins., various manoeuvres being carried out to demonstrate the control of the vessel to Mr. Haldane. On returning to *terra firma* Mr. Haldane expressed his pleasure at the experience, and said that although it was a peculiar sensation at first he was surprised at the lack of dizziness. Although he was unable to look over a precipice without experiencing this sensation, yet when the airship was 500 ft. up he found no discomfort in looking over the side.

FOREIGN AVIATION NEWS.



The new Paulhan biplane making a flight at St. Cyr last week.

Wynmalen's Protest Dismissed.

A SPECIAL meeting of the Commission Sportive Aeronautique was held on the 4th inst. at the premises of the Aero Club of France, to consider the protest made by Wynmalen against the action of the Automobile Club of France in connection with his Paris to Brussels flight. After hearing the evidence of Wynmalen and his assistant and others who witnessed the flight, a long and, at times, heated discussion ensued, but in the end the action of the A.C.F. was upheld. It will be remembered that the A.C.F. credited Wynmalen with the maximum time possible to secure the prize, the competition for which remains open to the end of next month. It is stated that Wynmalen will now place the matter in the hands of the Dutch

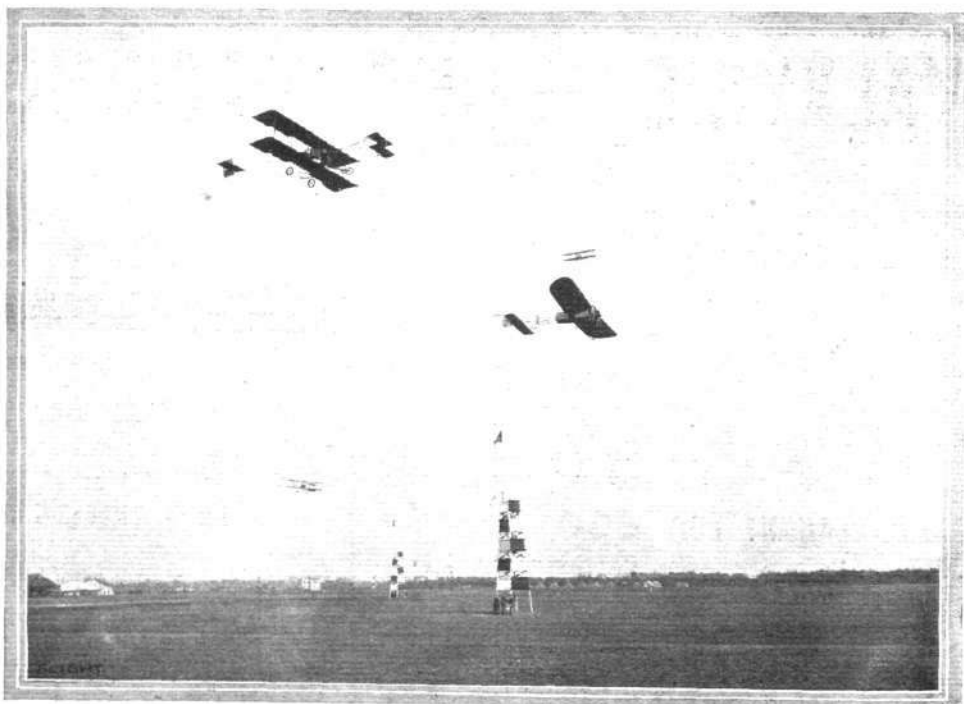
Aero Club with a view to getting that body to make an appeal to the Bureau of the Federation Aeronautique Internationale.

Mr. Henry Farman Weight Carrying.

ON Monday Mr. Henry Farman was at Mourmelon testing a new biplane of military type, and during one of the trial trips he took four passengers on the machine, the useful load being 350 kilogs. He also indulged in one or two very fast spins with a racing machine.

A Hanriot with Two Propellers.

FOR the past week very little flying has been seen over the Plain of Betheny owing to the windy weather which has prevailed,



AMERICAN INTERNATIONAL FLIGHT MEETING AT BELMONT PARK.—General view of the flying grounds, and a quartette of machines in the air.



Archie Hoxsey.

Walter Brookins.

Charles K. Hamilton.

AMERICAN FLYING MEN AT BELMONT PARK MEETING.

but during a short calm on the afternoon of the 1st inst. Lafargue made several rounds of the ground on his Hanriot monoplane, while De Feure, on a new machine of the same make, but distinguished by having two propellers, made several satisfactory tests in a straight line at a height of 10 metres.

A Good Flight by Train.

A VERY satisfactory flight was made by Train on his monoplane on Sunday afternoon, when he was flying over the neighbourhood of Mourmelon for 1 hr. 57 mins. Keeping his machine at an average height of 600 metres, he passed over Chalons, Suippes, Mourmelon-le-Grand, Mourmelon-le-Petit, and Bouy.

Madame Ferber in the Air.

AMONG the many visitors to the aviation corner of Chalons Camp on Sunday afternoon was Mme. Ferber, the widow of Captain Ferber, and her young son Robert. The Antoinette machines especially interested these visitors, and Madame was taken for a short trip by the tutor Gobe, while Instructor Cure took her son for a spin.

Trial of the Paulhan Machine.

PILOTTED by Caillé, the new Paulhan biplane was out on Saturday for trial at St. Cyr, and was in the air altogether for about an hour and a half.

Trials with a Breguet Biplane.

ONE or two good flights have been made recently at the Brayelle Aerodrome by the Breguet machine. On Saturday, M. Breguet, accompanied by Deryn, made a trip of about 10 kilometres, during which he passed over the Willows airship, which was at Corbeheim. Afterwards, Deryn was testing a biplane of the military type, and took two passengers for a trip. On the previous day Deryn, on a similar machine, was flying for an hour.

Long Flights at Buc.

A COUPLE of good flights were seen at the Maurice Farman School at Buc on Saturday last, when Herbster was aloft for 40 minutes with a passenger, flying at a height of 100 metres. During the afternoon Chevalier Rene de Knyff visited the aerodrome and was taken for a trip of 20 minutes by Mr. Maurice Farman.

Paris to Brussels and Back.

LEGAGNEUX is determined to have another try for the Grand Prix d'Aviation of the A.C.F., and is waiting at Issy for a favourable opportunity to start. On Saturday morning, after a preliminary test to see that everything was in order, he made a flight of 30 minutes, accompanied by his friend Martinet, who will again go with him when he makes his attempt to fly to Brussels.

Biérots for the Japanese Government.

ON Saturday last the Japanese Military Attachés paid a visit to Issy in order to witness some trial flights by Captain Bellinger on a two-seated military type Biérot which has been bought by the Japanese Government. Two of the Japanese officers were taken for trips by Captain Bellinger, and on landing they expressed themselves enchanted by their experience.

Prince Henry as an Aviator.

THE Darmstadt correspondent of the Leipzig *Neueste Nachrichten* is the authority for the statement that Prince Henry of Prussia during last week was actively experimenting with a Euler aeroplane at Griesheim, near Darmstadt. It is stated that Prince Henry accompanied Herr Euler on several trips, and then on Saturday last the Prince made a solo flight for a distance of about 1 kilometre. It is also added that great care is being taken to keep the results of the trials a secret, the aviation ground being surrounded by troops.



Clifford D. Harmon.

Ralph Johnstone.

Capt. T. S. Baldwin.

AMERICAN FLYING MEN AT BELMONT PARK MEETING.

Litigation Over the Etrich Monoplane.

ACCORDING to a note from Berlin, legal proceedings have been commenced by Herr Etrich against the Motor Luftfahrzeug Gesellschaft for infringement of patents.

An Appointment for Efimoff.

THE Russian aviator Efimoff, well known as a Farman pilot, has just been nominated as the chief of the school which is to be opened in connection with the Volunteer Aerial Fleet now being organised under the patronage of the Grand Duke Alexander Michaelovitch. During the winter the school will be carried on at Sebastopol, while during the summer it will be transferred to Gatschina. His salary will be nearly £3,000 per year, and he will be granted three months' leave of absence annually.

Flying at Turin.

AT the three days flying meeting arranged to take place during last week-end at Turin, although the high wind on Sunday precluded any flying then, some good exhibitions were made on Saturday and Monday. On Saturday, Fischer on his Henry Farman machine

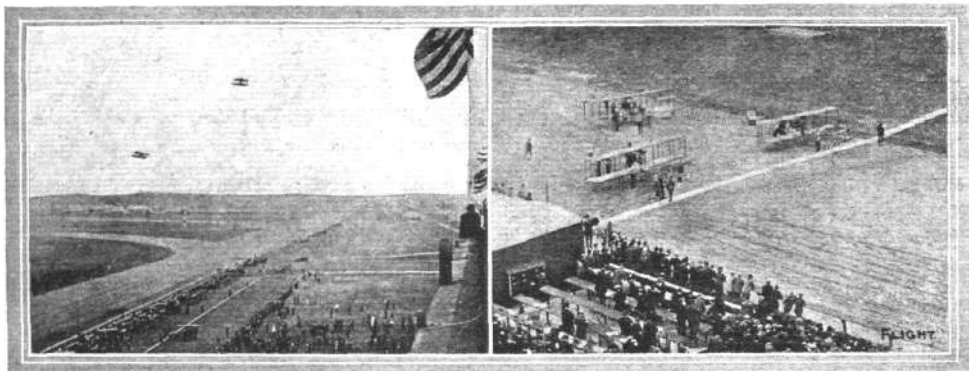
went up to a height of 1,000 metres and was lost for some time among the clouds. On descending he made several short trips accompanied by passengers. Weiss on a Koechlin, Bielovucic on a Voisin, and Eros also made some good flights, the first named being loudly applauded for a *vol plane* from a height of 500 metres. These same aviators were flying again on Monday, together with a local aviator, Gagliani, who has a Hanriot monoplane.

Mr. Orville Wright Coming to Europe.

A NOTE from New York intimates that Mr. Orville Wright will be paying a visit to Paris next month with the object of demonstrating a new model of the Wright machine which is said to offer great security against accident.

Latham Flies Over Baltimore.

ON Monday Mr. Latham paid a visit to Baltimore in order to give demonstration flights on his Antoinette monoplane, and during the course of a trip of 25 miles or so he passed over the town. He was in the air for 42 mins. 10 secs. On the previous day Mr. Drexel was doing some high flying, and he got up to a height of 1,100 metres.



AMERICAN INTERNATIONAL FLIGHT MEETING AT BELMONT PARK.—View from the Grand Stand, and a start for a one-hour flight competition.

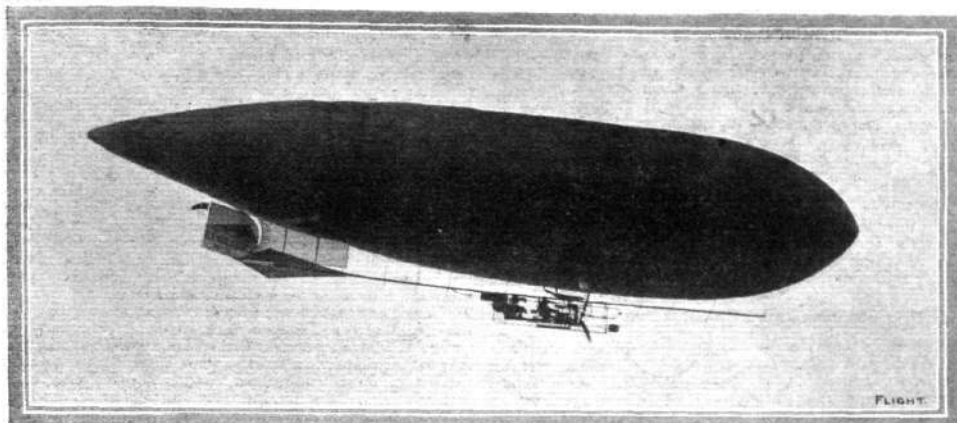
FRENCH WAR OFFICE COMPETITION FOR AEROPLANES.

AT the banquet which marked the successful conclusion of the Paris Aeronautical Show last week, General Roques, the new Inspector-General of Military Aeronautics, announced the details of the competition which will be held by the French Government during October next, with the object of obtaining the aeroplane most suitable for military use. In all, some 1,100,000 francs (£44,000) will be devoted by the French Government to prizes and the purchase of aeroplanes in connection with the competition. The winning machine will be bought by the Government at a price of 100,000 francs (£4,000), and the constructor will receive an order for ten similar machines at a price of 40,000 francs each, this price being subject to an additional bonus of 500 francs for every kilometre that the average speed during the final run of 300 kiloms. exceeds 60 kiloms. per hour, up to a maximum speed of 80 kiloms. per hour. The constructor whose machine is placed second will receive an order for six machines at a price of 40,000 francs each, subject to the same speed bonus, while the builder of the machine placed third will receive an order for four machines on the same terms. Should there be only one machine which satisfies the conditions, the builder of it will receive the prize of 100,000 francs, and also the full order for 20 aeroplanes. To be eligible the machines must be entirely constructed in France, but the builders need not necessarily be French subjects. The entries close on January 1st next, and the competition has been fixed to start on October 1st, 1911. Although it has not yet been definitely fixed, it is probable that the qualifying trials for the final 300 kiloms. test will be conducted on the military grounds at Satory, and will be continued during the month, after which the machines which have satisfied the judges will be required on a date during November, to be specified by the Minister of War, to undergo the final test mentioned, on which the awards will be made.

Each machine must be fitted with three seats, one for the pilot, another for the mechanic, and the third for the observer. It

must also be capable of carrying a useful load of 300 kilogs., not including fuel, oil, water, &c. A minimum average speed of 60 kiloms. an hour will be required to be maintained over a distance of 300 kiloms., and the machine must be capable of landing and restarting on ploughed land, prairies, stubble fields, or meadow land. It must also be possible for the machine to be transported by road or railway without being taken entirely to pieces. The eliminating trials will consist of six separate tests. In the first three the machine will be required to start fully loaded and alight on ploughed land at a fixed point 50 kiloms. from the start. At this point it will have to demonstrate its ability to start again. Each time it will be dismantled, and transported back to the starting point either by road or rail. In the fourth test the machine, while carrying its full load, will be timed over 50 kiloms. to see that it is capable of fulfilling the speed conditions, the course being an out and home one, and the machine being required to land at the point at which it started. The last two tests will be for altitude, the machines being required to attain a height of 500 metres within 15 mins. In the final tests the selected machines will be drawn up and started at 5 minutes intervals, and with their useful load of 300 kilogs. the machines will be required to complete a journey of 300 kiloms., maintaining a speed of 60 kiloms. an hour. Should a competitor not be able to get away properly at his appointed time, he will have to wait until the others have departed before restarting. Should the first attempt fail, the competitor will be allowed 48 hours during which he may make a fresh start, and should this also fail, he may within two days make a third attempt. Each competitor will, in fact, be allowed to make three tries, so that if not satisfied with the first attempt he may try and improve on it. The prizes will be awarded to the machine making the best time over the full course of 300 kiloms. During the trials, any repairs necessary may be carried out, even to the extent of a new machine being substituted for a damaged one, so long as it is identical in every respect, and should it be necessary the pilot may be changed.

AIRSHIP AND BALLOON NEWS.

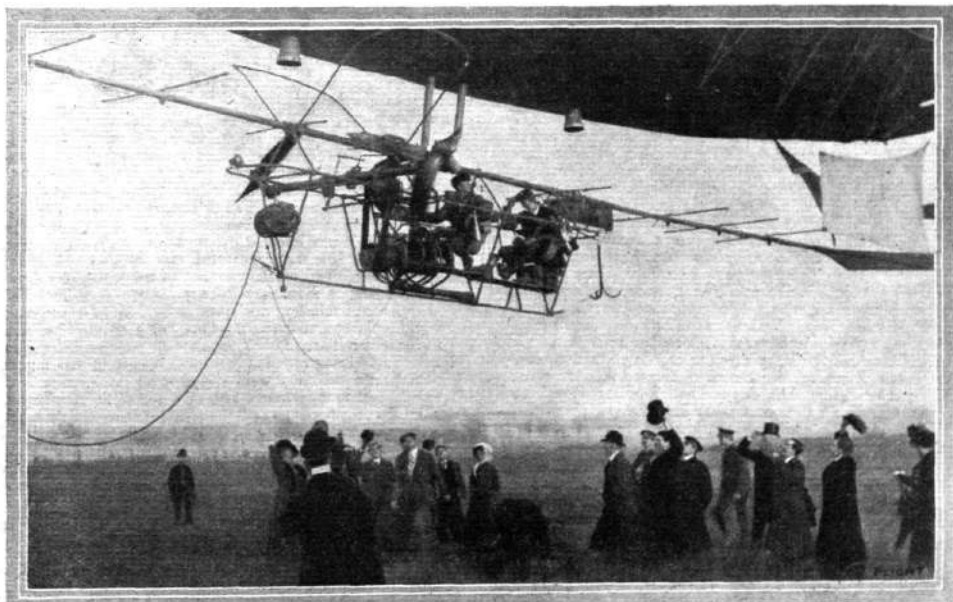


The Willows airship well away on its voyage to France.

The Willows Trip to France.

IN view of the way in which foreign aviators are treated when they happen to land on British soil, it is instructive to note the treatment meted out by our neighbours across the Channel when a Britisher happens to land there. On Mr. Willows coming down at Corbehem, near Douai, in order to discover his whereabouts, he was rather surprised when three gendarmes mounted guard over his ship, and an officer demanded the payment of about £30 Customs duty. Matters were eventually smoothed out by the Aero Club of France, who explained that the incident arose simply owing to the fact that notice had not been given to the Customs authorities, who were bound to act as they did. The airship was brought out from the *Daily Mail* garage at Wormwood Scrubbs on Friday afternoon, and, with Mr. E. T. Willows piloting her, assisted

by Mr. W. Goodden in charge of the engines, a start was made at 3.25 p.m. Steering straight across London, the aeronaut then made for Bexhill, and at 6.35 the English coast was left behind. Two hours later the French coast was in sight. At 10 o'clock the vessel was taken to a height of 5,500 ft., in order to enable Mr. Willows to steer by the stars, as the clouds prevented him picking out the places passed over. Later, the weather became very foggy, and at 2 o'clock in the morning Mr. Willows decided to bring his craft down. Mr. Willows had no idea where he was, but when the two aeronauts had got the machine on the ground safely anchored they found a peasant and sent him off to the village to get help. The framework of the car was somewhat damaged in the landing. M. Breguet, whose flying ground at La Brayelle is not far off, motored over to render what aid he could to Mr. Willows, and afterwards, when making a second visit, he flew over in his aeroplane.



THE WILLOWS AIRSHIP'S VOYAGE TO FRANCE.—Wishing Mr. E. T. Willows and his companion, Mr. Goodden, *bon voyage* as the airship rose from Wormwood Scrubbs.

Mr. Willows had intended, after repairing his machine, to complete the journey to Issy, and a large crowd gathered there on Sunday afternoon to welcome him. The weather conditions, however, changed in the meantime, so that Mr. Willows deemed it advisable not to go on. He therefore had his balloon deflated, packed up and sent to Issy by rail, where it found a temporary home in M. Clement's dirigible shed.

"Daily Mail" Garage at Wormwood Scrubbs.

SINCE the *Daily Mail* airship garage on Wormwood Scrubbs was officially taken over by the Government on Saturday week, it has been proposed that it should be taken down and re-erected at Farnborough. This point, however, has not yet been settled, and other matters which are also under consideration are the question of a new door and the improvement of the floor. At present the latter is made of cinders, and it is proposed to replace this by concrete. The big curtain which closes the mouth of the shed has become very weather-beaten, and will have to be repaired or replaced, and in the latter case wooden shutters may be utilised instead of the canvas curtain.

Trying to Beat the Balloon Record.

ON Wednesday afternoon the *Daily Graphic* balloon left the grounds of the Crystal Palace in an attempt to beat the distance record of 1,355 miles set up by the balloon "America II" in the Gordon-Bennett race. It carried five passengers, these being Mr. Gaudron, pilot, Mr. Hunter, representing the *Daily Graphic*, Lieut. Mailand,

Mr. Pattison and Mr. Collingwood. The balloon has a capacity of 163,000 cub. ft., and it is fitted with a double basket, one being below the other. According to the calculations made beforehand the balloon should have been able to keep up for 68 hours. It was anticipated that the landing would be effected in Russia, but it eventually landed in the forest near Korkhofen, in Bavaria, the distance being about 550 miles in a straight line from London. The cars were caught on the top of the trees, seven of which had to be felled before the balloon could be released. The balloon fell from a height of 19,450 ft., the last 12,000 of which were passed through in three minutes. Fortunately all the passengers escaped injury, but the envelope became a total wreck.

A Derelict Balloon.

THE inhabitants of Queen's Road, Peckham, were somewhat startled on the evening of the 1st inst. to find a balloon settling down on the roofs, and an air of mystery was given to the proceedings by the fact that the basket contained no passengers. It subsequently transpired that the balloon was the Hon. Mrs. Ascheton-Harbord's "Nirvana," which had broken away from her moorings at Battersea while being prepared for a cross-Channel trip. After a collision with a gasometer which tore a hole in the envelope, the gas escaped somewhat rapidly and so brought the balloon to earth, or rather the roofs of the houses. A good deal of damage was done to chimney pots and such like, and it was some time before the gang of workmen could get it down from the roof. This, however, was eventually accomplished and the damaged balloon was sent back to the works at Battersea.

CORRESPONDENCE.

. The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries.

Correspondents communicating with regard to letters which they have read in **FLIGHT**, would much facilitate ready reference by quoting the number of each such letter.

NOTE.—Owing to the great mass of valuable and interesting correspondence which we receive, immediate publication is impossible, but each letter will appear practically in sequence and at the earliest possible moment.

CLASSIFICATION OF AEROPLANES.

[880] It has occurred to me on many occasions when reading the description of new machines that the lengthy sentences or paragraphs referring to the general arrangement of the surfaces would be unnecessary if some sort of type classification were adopted.

In locomotive engineering there has during the last decade or so been brought into use a most excellent method of classifying railway engines, which, so far as I can see, might be equally well adapted to aerial locomotives.

This classification system consists in the use of numerals arranged in a certain order to represent the wheels. The first figure, reading

from left to right, is used to denote the number of carrying wheels, the next indicates the number of driving wheels, and the last the trailing carrying wheels. Thus if an engine has, say, a leading four-wheeled bogie, four coupled driving wheels under the boiler-barrel, and a pair of carrying wheels under the firebox or footplate, it is spoken of as a 4-4-2 engine. If it is an older type with a single pair of leading wheels, four coupled driving wheels, and no trailing wheels, it is written down a 2-4-0 type.

Now what I want to suggest is that the same method should be applied to aeroplanes. I have thought over all the existing types, and I find they can all be expressed by the use of three figures with a hyphen between them. The numerals are, of course, to represent the planes, and the first one is to indicate the elevator, the second the main planes, and the third the tail. In application to aeroplanes we can go a step further than is possible in locomotive practice, for by the insertion of the letter P we can indicate the position of the propeller.

I have made a few sketches to illustrate the application. Fig. 1 is a Farman machine, which would be referred to as a 1-2-P-2 machine. Fig. 2 is a Blériot, which is a 0-P-1-1 type. Here the 0 indicates the absence of an elevator. Similarly the Wright machine, 3, would some time ago have been referred to as a 2-2-P-0 machine, the 0 here indicating the absence of a tail, whilst that on which the late Hon. Chas. S. Rolls met his death was 2-2-P-1.

Even the elevatorless tailless type Dunne aeroplane can be expressed thus 0-2-P-0.

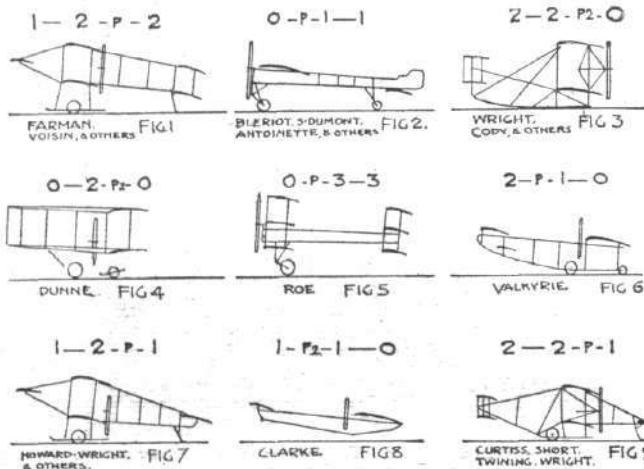
The new Valkyrie is a 2-P-1-0 machine; A. V. Roe, 0-P-3-3. My own type is, like the Curtiss, a 2-2-P-1.

I trust that I have not written to an unnecessary length on a matter that may not be deemed of any importance, but it seems to me that you might save a little valuable space by adopting the above suggestion.

October 6th.

E. W. TWINING.

[None better than ourselves can appreciate what an advantage any system of saving space would be to **FLIGHT** at the present time, but we have our new readers to consider as well as those who have studied the subject for a sufficiently long time to find no difficulty in assimilating Mr. Twining's idea. As a method of tabulating types of machines it has much to commend it, but as a method of description in the text we fear that the time is not yet. At any rate it will be interesting to hear what others have to say about it.—ED.]



THE WAR OFFICE AND FRENCH AEROPLANES.

[880] Now that the War Office is taking an interest in aviation they are at once criticised for having ordered French aeroplanes instead of English copies of the same. I hold no brief for the War Office, but as I have been somewhat responsible for stirring up an interest in aviation in this country, lastly by describing the effect of aerial scouts at the French manoeuvres, I am sorry to see our War Office at once subjected to criticism at the commencement.

I may say in the first place it is impossible to copy a Farman machine such as the Government have ordered, as any copy must necessarily always be behind the latest improvements, and so far as I know there is no machine of the type ordered in this country to copy. Secondly, and on this point I am sure you will be in agreement, it is not playing the game, after the risk and work Henry Farman has put into flying in order to produce the flying machine of to-day, to copy him without acknowledgment.

I have known Henry Farman since the time when flying a few yards was a feat involving experiment after experiment, and since that time he has put in year after year of arduous work and risk to evolve the present machine, but since that time we have practically done nothing to help on aviation. We have been absolutely apathetic, and, apart from what patents there may be, apart from the fact that it is not possible to copy the latest novelties, it is not quite a sporting thing to even attempt to copy without acknowledgment.

I am, however, quite in agreement with the sentiment that our machines should be British-built of British material by British labour, and with that very object in view I have arranged with the Farman Brothers that their machines shall be built in this country; they will not, however, be copies of machines of past date. Every novelty introduced in France will be simultaneously produced in this country under the supervision of the Farman Brothers, and last, but not least, the inventor, to whom flying owes so much, will receive his due as such, whilst the industry will be a British one.

G. HOLT THOMAS.

NATURAL STABILITY.

[881] I feel inclined to agree with your correspondent, Thos. Kelham (812), in advocating a low centre of gravity. The matter has seemingly never been thoroughly thrashed out, and most people who criticise it confuse the idea with that of applying the propeller thrust at the same low point. There is, however, evidently no reason why this should be done if we use a chain or bevel gear transmission between the engine and propeller. Moreover in many successful machines of the present we find the c.g. very much below the c.p.; most biplanes, for instance, have all the weight placed immediately above the lower plane instead of half way between the two, and in the latest Farman biplane and Roe triplane the c.p. has been still further raised relatively to the c.g. by reducing the area of the bottom plane. The principle is mathematically so obviously correct that it deserves more practical and experimental investigation than has hitherto been devoted to it.

Prescot.

J. T. MATTON.

MR. PASSAT'S ORNITHOPTER.

[882] I am pleased to forward you the photos and the particulars of my ornithopter, which I promised you.

This I claim to be the first flapping-wing machine which has risen successfully off the ground for 20 yds. with an ordinary motor cycle engine of 4-h.p. It is now being fitted with a light 8-h.p. George engine, and is expected to go to Brooklands shortly. This is the result of five years' study. I claim to have mastered the secrets of birds' flight, not only theoretically but practically, and I just lately had to strengthen some parts of the machine on account of the wings giving a far greater propulsion than I thought possible.

The machine spans 24 ft. across and is 20 ft. in length.

The front wings are used as an elevator, also for lateral balancing; they are worked individually, while the back wings are flapping by means of a very simple mechanism. The tail is used as a rudder.

The wings of this mechanical bird can be folded in ten minutes, and the machine is then ready to go along the road exactly the same as a motor car.

In the pilot's seat, in the photograph, is Mr. A. Shury, and on the right myself and Mademoiselle Passat.

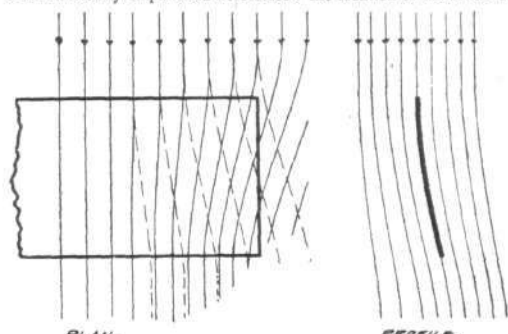
Hoping this will prove interesting to your readers, and wishing your journal every success.

Wimbledon, Oct. 23rd.

J. B. PASSAT.

C.P. AND ASPECT-RATIO.

[883] I have for some time been attempting to investigate the lifting powers of different surfaces by finding the direction and magnitude of the displacements whose reactions occasion the lift. These observations indicate one point of considerable importance to anyone engaged in this field of research, which I do not believe has been sufficiently emphasised heretofore: the location of the centre of



pressure varies, not only with the curvature and angle, but also with the aspect ratio.

If a plane or curved surface be placed at a lifting angle in a current of flowing liquid, as in the accompanying sketch, the currents near the ends of the surface and adjacent to it will take the paths shown by the light lines, on the top, and by the dotted lines, on the bottom. The extent of sideways displacement seems to be constant for a given angle, curvature, and depth of plane, and largely independent of the length of the leading edge (provided this is more than twice the depth), so that its relative effect would vary with different



Mr. J. B. Passat's ornithopter, fitted with a small motor-bicycle motor, with which he has raised himself off the ground.

aspect-ratios. As this affects the pressure distribution, it would affect the lifting power and also the centre of pressure, so that experimental determinations made with square surfaces could not be safely applied to the design of the surfaces more commonly used.

The above suggests the reason for the downward curvature at the outer ends of the Wright and (I believe) the latest Blériot machines.

It also suggests the possible increase of automatic stability by variations in the plan-form, in conjunction with proper profile curvature, the whole, I think you will agree, offering a most inviting field for investigation.

Dayton, Ohio.

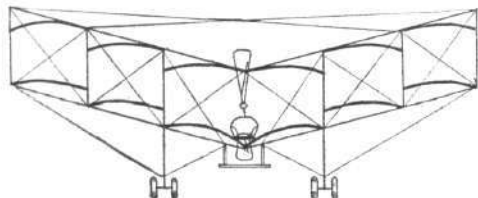
F. C. MOCK.

MR. McNEILL'S BIPLANE.

[884] I have been very interested to read letter 782, in your excellent paper.

Mr. McNeill and myself have been *thinking in parallels*.

I enclose a rough sketch of my biplane, which may interest you. Practically the only difference in our machines is that he uses side curtains to prevent escape of air, while I have adopted a system



of curved planes, which I maintain has the same effect, and does away with the danger from side winds.

I fancy, too, that my construction would be stronger than Mr. McNeill's. However, in the face of his letter, I thought the enclosed might interest you.

Portland Place.

GODFREY TEARLE.

ANOTHER BRITISH MACHINE.

[885] I enclose two photos of a monoplane, which I hope you will consider worthy of illustration in your journal.

This machine was built by my brother and a friend (both engineers) and possesses several novel features. The frame is made of steel tubing, welded by oxy-acetylene process; the backbone is of bamboo, and the main plane is in one piece, and can easily be detached from the frame.

The pilot's seat is below the main plane, giving a low centre of gravity.

All the controls are by the steering-wheel, which is raised and lowered for elevating and descending, and moved right or left for warping wings.

Although this machine was designed long before the particulars were published in your journal, it is very similar to the successful German monoplane built by Herr Grade.

The constructors have been unable to give this machine a fair trial owing to lack of funds and a suitable practice ground, and I thought you might be able to put them in touch with someone interested who would assist them, for a share in the machine.

Beckenham.

ARTHUR H. SIPPE.

SPEED-ALARMS.

[886] Referring to the designs for above published in your valuable paper, I would like to mention a point which has probably

been overlooked. I have not studied all the designs, but think they all depend on the speed at which the machine is travelling through the air; in fact, this is apparently the only possible principle on which such an indicator can be produced. But the real danger is that of excessive land-speed, which, under certain conditions, these instruments will, without exception, either fail to indicate when it does exist or else announce when it does not exist. Accidents such as that which caused the death of the Hon. C. S. Rolls may very possibly result from an attempt at landing in a downward current of air, and if this has a fairly high velocity a dangerous landing-speed might be attained without the alarm device giving any indication to that effect. On the other hand, a descent at safe speed in a rising air-current would probably cause the instrument to record a dangerously rapid progress of the machine. In horizontal flight there is, of course, no such thing as dangerous speed, and it is only when returning to Mother Earth that one wants to be reminded of "speed limits."

Prescot.

J. T. MATTON.

NATURAL STABILITY AND THE CRUCIFER AEROPLANE.

[887] In the October 15th issue of FLIGHT, I read a brief illustrated description of the Crucifer aeroplane, and noticed therein a vital error in mechanical fact which, possibly, influenced you in the interesting remarks which you made on "Natural Stability versus Quickness of Control."

The error lies in the statement that "The control of the planes about the body is intended to be effected by the automatic operation of balancers, A, which are adjusted by chain mechanism, C, that is moved by a running weight, B" (the italics are mine). It is evident that you do not see how automatic movement of the balancers is to be thus attained, because you use the word "intended," and because it is not shown *how the weight is made to run*. In fact, the balancers are not moved by the running of the weight, but by means which I shall describe later, and which will discover to you that your closely reasoned, logical and convincing advocacy of the desirableness of natural stability constitutes a most complete defence of the principles which govern the construction of Crucifer.

Crucifer claims in his embodiment means whereby he secures stability automatically. That is to say, he is able to balance himself, both laterally and longitudinally, instantly that his normal condition of equilibrium, during flight, is disturbed. He can be proved, by sight, to be perfectly balanced before ascent, and it will be shown how his balance will be automatically maintained, aurally, while it may be simply stated that, both laterally and longitudinally, his balance is, in addition, subject to the control of the pilot.

Laterally, disturbance of his wings operates, with the *vis inertia* of his body, to actuate mechanisms to oppose such lateral disturbance, the actions set up being of such simultaneity that canting is practically choked at its inception; and this, Sir, you remark, is, "after all, the great desideratum." It is well known that the common practice, when a machine with rigid wings is canted, is for the pilot either to warp the wings or to move minor planes to re-assert the balance. Crucifer performs the action of wing-warping or moves the balance-planes himself. Necessity for such action on the part of the pilot is eliminated, but the pilot may, as stated, assume control should he desire. The automatic result attained is that which has been sought by many serious students of aeroplane construction, who have striven to secure it by means of wind vanes, electricity, pendulums, gyroscopes, and other devices. The means whereby Crucifer obtains, automatically, the lateral balance may be now particularly described. Let it be first stated that the aeroplane consists of a framework which supports both the wings and the carriage; and also of a body which encloses all the



Mr. A. H. Sippe's Monoplane.

weight of the machinery, pilot, passengers, and stores. The body is hemispherical at the head, and has a conical tail which is joined to the head by a short cylindrical trunk. Encircling this trunk, at the centre of balance of the whole system, and recessed within it, is a collar with ball or other bearings to minimise friction, interposed. The collar has, one upon each side, a trunnion. The trunnions fit into the uprights of the frame which supports the carriage and wings. During flight, lateral disturbance of the wings will incline them to cant about the body with the collar; though the body, being free of their influence, remains laterally unmoved. But the wings are not permitted to cant freely. On the top of the body, on either side of the collar, in a longitudinal sense, are fixed the bearings of a shaft which carries a pinion. The collar has, on its upper segment, a chain or rack. On lateral disturbance of the wings, the cant thereby set up moves the rack on the collar against the pinion, which is preserved in position by the inertia of the body. The pinion is a lever with the body for its fulcrum, and, moved by the action of the rack, operates the balance-chain, which in its turn moves the balance planes which counteract the initial canting action of the wings. It will be seen that action and counteraction are simultaneous, so that the original cant of the wings is attacked instantly that it is set up. The inertia of the body is a potent factor. It may be said that by this system its disadvantage is eliminated, while full advantage is taken of its inherent force. The weight, B, was also incidentally moved by the balance-chain upwards and outwards towards the rising wing-tip, but as it was realised that its action was only redundant, it was excised.

Longitudinally the automatic balance is effected through the inertia of the engine, which is suspended at the centre of balance of the system from a member disposed from side to side of the body through its diametric centre. It will be remembered that there is practically no lateral motion of the body. In operation, should the aeroplane diverge from the horizontal, the engine, by gravity, causes a relative movement between the sling parts and the cross-member; and this motion is employed to actuate the horizontal rudder to restore the craft to its normal position.

Such, Sir, are the methods by which the balance of Crucifer is maintained. There is nothing, you will observe, either profound or complex about them; but they should produce that natural stability which we all desire.

It is to repeat an axiom to say that stability in the air depends upon the preservation of the equilibrium of the aeroplane; but the balances, laterally and longitudinally, must be absolutely exact before flight or during flight; resistance, causing reduction of speed, must necessarily be experienced by some part of the system; and the balances will not be so sensitive that when they are disturbed—and they may be easily disturbed in some directions—they may be equally easily rectified. In Crucifer the lateral balance of the body remains practically undisturbed. The lateral balance of the wings may be disturbed, but is instantly and automatically restored. The longitudinal balance of the body may be disturbed, but a plane of resistance, simultaneously brought into play with and by the disturbance, immediately corrects it; the lengths of motion being practically inappreciable at the centre of gravity, where is situated the engine, and, in its immediate region, the passengers in the aerial craft.

It will have been seen that Crucifer claims to be a perfect automaton in respect of his aerial balance. Should his pilot become incapacitated, or should his engine fail, he should not dive, but glide to earth. And should his wings, by sudden wind gust or other cause, become unduly laterally inclined on reaching *terra firma*, so that they come into contact with the earth, it is obvious that they should not crumple up, but should move easily about the body, and should in doing so adjust his carriage so that he may alight upon an even base. He will permit his pilot complete freedom of observation, a very considerable degree of movement, and will afford him also protection from the weather.

These are large claims, but investigation is courted; for, if he be found an unsafe vehicle, he has no *raison d'être*. If he cannot speak for himself, it will be impossible for anything further to be said for him by his inventor.

Hayward's Heath.

L. BEAULIERC GOLDMAN.

BRAKES FOR AEROPLANES.

[888] May I refer again to my letter, No. 746, re brakes for aeroplanes, which you inserted in your journal. What I meant was not the wheel-and-skid combination of Ogilvie's Wright machine, but a simple wheel rim brake such as is used on bicycles.

I see that Mr. Glenn Curtiss has already a brake on his biplane, but he follows the old-fashioned method of pressing the brake-block on to the tyre itself, which must surely be detrimental to it, for use will soon wear the covering rubber away.

Bootle.

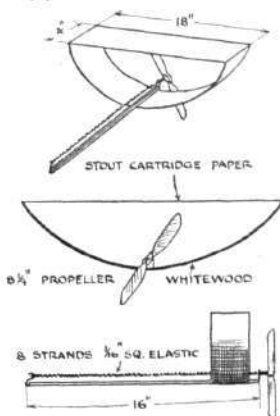
A. G. PUGH.

MODELS.

MODEL BIPLANE.

[889] As readers of your excellent paper, we beg to enclose a description and sketches of a simple scientific model biplane, of our own design and construction, hoping it may prove of use to some of your readers.

A slight upward curve is given to the paper along the back of the top plane.



Span of top plane, 18 ins.; width, 2 1/4 ins.

Span of lower plane, 20 ins.; width, 2 1/4 ins.

The lower plane is white-wood steamed and bent, and the top plane is stout cartridge paper, stretched tightly across and glued on each end of bottom plane. The curve along the back of top plane is given by pasting a strip of thin paper over the rear edge of cartridge paper. This gives the necessary upward curve.

The bottom plane is fixed by elastic to the frame, and as near to the propeller as possible. A white pine stick, 7/8 in. square by 16 ins. long, is all that is required for a frame.

The 8 1/2 in. propeller is driven by eight strands of 1/8 in. square elastic. The model is a very steady flyer indeed.

Wolverton. J. LANE, W. H. KING, and P. W. STEVENS.

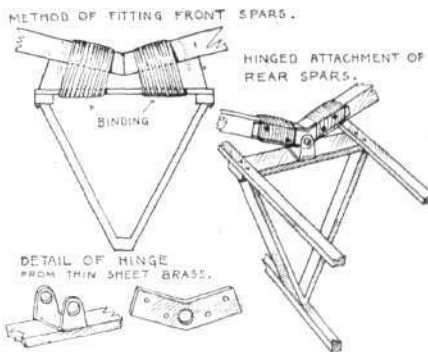
[The inverted arch arrangement of the underplane was the great feature of G. P. B. Smith's model, which secured several prizes for stability.—Ed.]

MODEL ANTOINETTE.

[890] Could you tell me the best way to join the main spars of a model Antoinette.

Raynes Park.

J. H. CARDEW.



[The accompanying sketch illustrates a method that should be suitable for model work.—Ed.]

SINGLE-SURFACED PLANES.

[891] I see an inquiry (letter 823) for a simple and satisfactory way of making a single-surface plane. I enclose some sketches of the methods I have adopted on several of my models, which may, perhaps, help your correspondent. The spars are made from thin bamboo tips, such as are used in the garden. The end rib of each wing, and that nearest the body in each wing, are made of 1/8 in. whitewood.

Having determined the shape of the camber, cut out a pattern in stout cardboard, and fashion a whitewood rib from it. Bore the spar with a small hole, and fit the ends of the rib in, binding

securely with a thin strip of medical plaster. For the other ribs split bamboo is used. The wood is split and made into strips about $\frac{1}{4}$ in. broad, and thick enough to be rigid. The strips are then steamed and bent to the shape of the cardboard pattern, the spar being above the ribs and the front spar below them. The tail of the rib protrudes beyond the spar, and a thread is stretched between the tails, thus forming a sharp trailing edge to the plane. The ribs should not be more than 3 ins. apart — closer if possible.

My reason for making the outermost and innermost ribs of solid wood is that these ribs thus keep the wing rigid without the use of other stays, and also prevent pressure being put on the bamboo ribs, which might cause the camber to change.

In building a biplane the uprights may be of bamboo, and easily fixed ends are shaped, as shown in sketch, and fitted into holes bored in the spars. They are then bound with the medical plaster to the spars. This method is not so flimsy as it sounds, and models 4 ft. span can be made this way.

An alternative and very successful way is to make the spars of $\frac{1}{2}$ in. whitewood, about $\frac{1}{4}$ in. broad. The end ribs are made as before, and threaded on to the spars, which are laid flat. The other ribs, made as before, are bound with the indispensable medical plaster to the spars, the back by boring the upper and lower spar, and through it putting a pin or gramophone needle, on to which the upright is threaded, and bound with plaster. When the planes are stayed with cotton or thread, the whole job will be found very satisfactory and very rigid. Very thin paper put on with Stickphast's paste will surface the plane. If it is desired to drive a nail through a narrow piece of wood this may be accomplished without splitting the wood by binding it with the medical plaster.

Sydenham.

LANCELOT L. VIGERS.

SMART MODEL WORK.

[892] I enclose a photo of a model of Mr. Moisan's monoplane I have made. I copied it while he was staying at Rainham. It is



4 ft. 2 ins. across the planes, 3 ft. overall length, and weighs 13 ozs. Rainham.
H. P. RICHARDSON.

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